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January 30, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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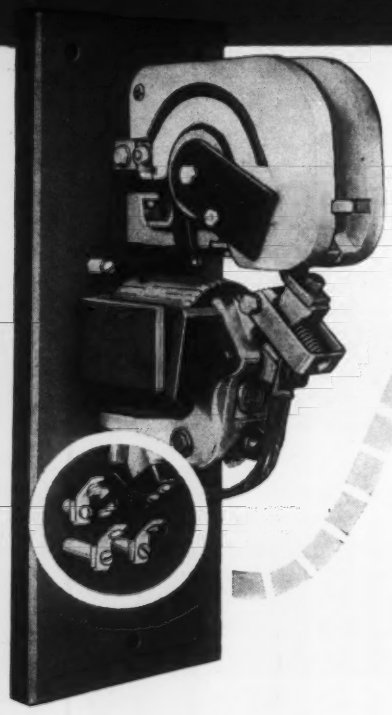
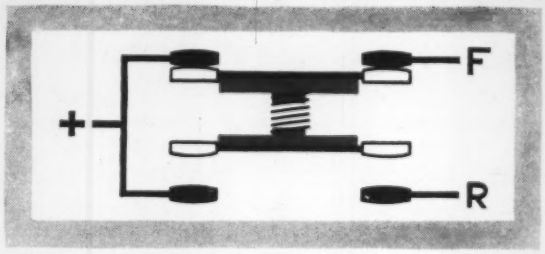
Safer Electrical Interlocking on All EC&M *LINE-ARC* CONTACTORS





Two sets of double-break contacts—isolated from each other—no carry-over from one to the other by an arc.

A Good Reason for Specifying EC&M Magnetic Control

Magnetic contactor controllers use electrical interlocks to maintain safe motor connections, to regulate sequence of contactor operation, and for other important functions that promote efficient operation of motors or of control or of both motors and control.

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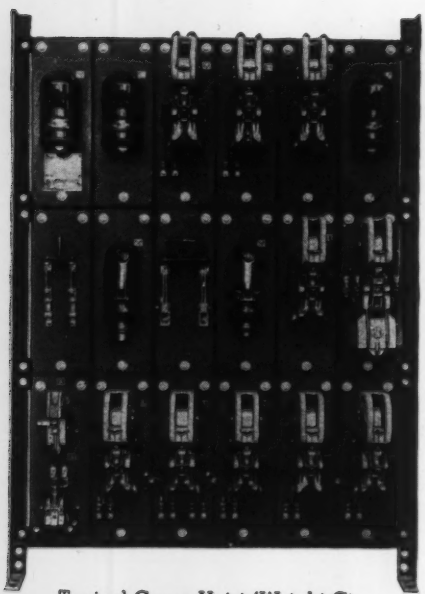
Movable contacts, carried in an insulated slotted frame attached to the contactor arm from the front, are easily inserted or removed without tools. The normally-open contact bridge is *isolated* from the normally-closed bridge by two insulators (shown in red in the sketch above). These insulators keep the spring in alignment and *prevent* the spring from carrying current from one bridge to the other.

Coin-silver contacts are used on these new electrical interlocks. With two movable contact bridges (instead of one previously used) and each *isolated* from the other, normally-closed circuits *cannot be carried over* by an arc to *normally-open* circuits or vice versa.

Safer electrical interlocks—a good reason for specifying EC&M Magnetic Control.



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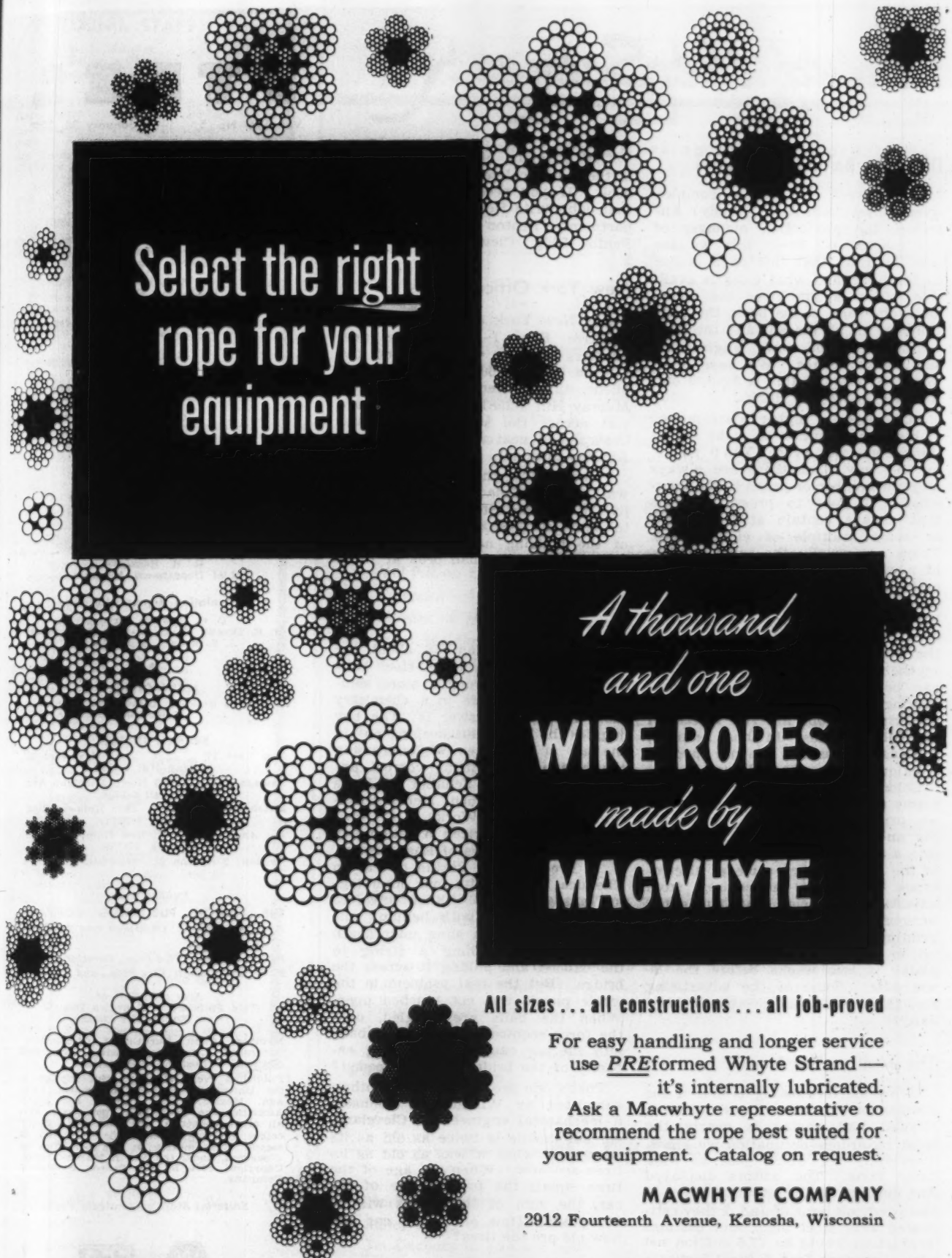

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THE Morgoil Bearings first purchased by 46 companies operating rolling mills totaled 920 bearings. Since that time these same 46 companies have purchased an additional 3780 Morgoils for other installations and are *now* operating a total of 4700 bearings . . . None have failed in service.

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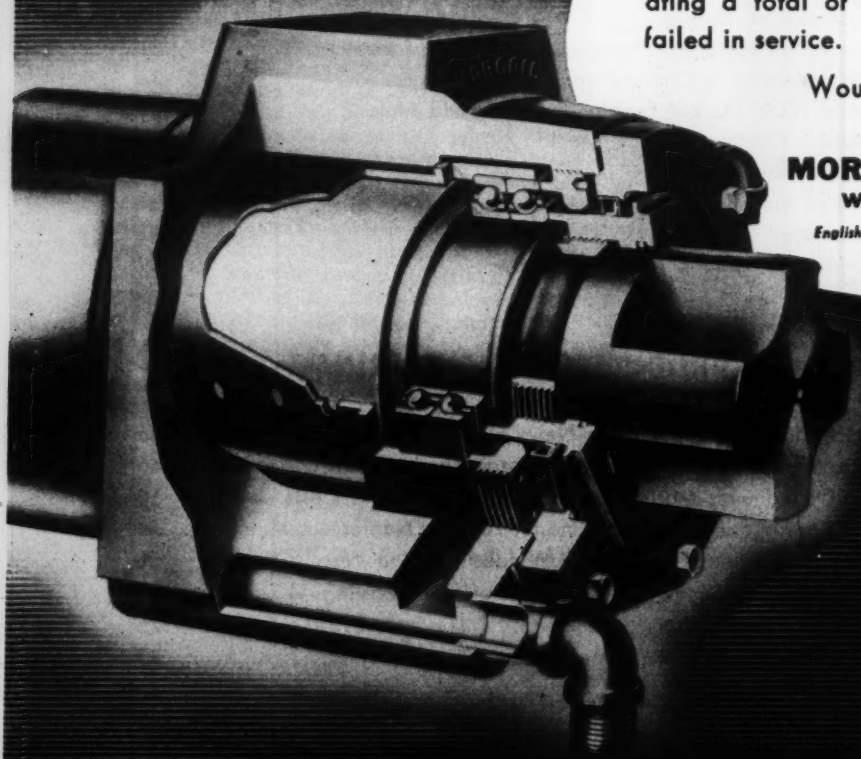

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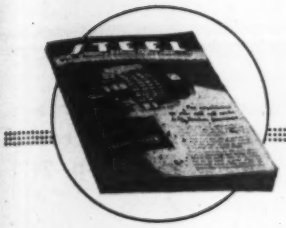

January 30, 1950

Deductions Ad Infinitum

It is high time that responsible leaders in industry and government give serious attention to the problem of payroll deductions. Is the practice of withholding amounts for this or that from a man's paycheck sound in principle? If so, what are reasonable limits as to the kind and number of items deductible?

There was a time when employees' paychecks represented the amounts they earned. Among the few exceptions were cases where amounts for purchases at company stores or for rent of company-owned houses were deducted. Every now and then instances of hardships or abuses arising from these deductions were reported in newspapers. Public indignation was aroused. It is fair to say that several decades ago payroll deductions were definitely under suspicion, if not in disfavor.

Today deductions from one's earnings are the rule rather than the exception. Participation in the practice by the federal government has helped to give it respectability. Also it is true that deductions from payroll in certain instances are beneficial to employees in many ways.

Against the obvious advantages are a number of disadvantages which to date have been almost completely overlooked. One is the disposition of the average wage earner to look upon his "take-home" pay as the amount his employer pays him. The employer seldom gets any credit for the earnings of the employee which are deducted for taxes, social security and similar purposes. This is a serious problem of employer-employee relations.

Another disadvantage lies in the real threat that bureaucrats, having discovered how easy it is to obtain government revenue through the painless payroll deduction technique, will expand their operations in this field. The prospect in this respect already is alarming. The Ohio Chamber of Commerce points out that four "welfare" programs now being considered by federal and state legislatures, if adopted, eventually would require deductions from payroll and payments by employers of more than 15 per cent of payroll.

This, on top of income tax withheld and numerous other present deductions, would create an intolerable situation. What we need are strong men in important positions who will fight to restore to the ordinary citizen his right to spend more of his own money according to his own wishes.

* * *

MERIT DOESN'T COUNT: There is a quirk in the Chrysler strike which throws significant light upon the thinking and strategy of certain union leaders. Chrysler offered a $100 per month pension plan, including social security, for employees with 25 years of service. This package corresponds rather closely with the pensions granted by steel companies, Ford Motor, rubber companies and others. The offer was rejected. Oddly enough, after the strike was on, pickets carried signs reading "Ford got it, steel got it, we demand it."

In reality Chrysler offered what the Ford and steel workers accepted. The offer was rejected because the union contends that the pension would cost Chrysler only 3 cents an hour per employee. This figure probably is not correct, but it is true that a pension plan identical with Ford's would cost Chrysler somewhat less than it would cost Ford. The reason is that the average age of Chrysler employees is less than that of Ford employees and perhaps of that of employees in many other large corporations.

So the Chrysler offer was not rejected on its

(OVER)

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merits. It was rejected on the basis of its cost to the company. The union demands a full share of whatever advantage accrues to the fact the average age of Chrysler employees happens to be low.

If all unions persist in exploiting actuarial differences of this nature, bargaining for pensions will become hopelessly complicated.—p. 19

* * *

BLONDE THAT CAN COOK: As you read the news in this issue, note how frequently chief executives of large corporations are called upon to answer questions publicly. In Washington a number of the officers of leading steel companies were called upon to explain recent increases in the price of steel. In February steel executives again will face the Celler committee in an investigation on prices.

These frequent appearances of industrialists before examiners—whether they be governmental committeemen or representatives of the press—emphasize the point that today a top executive needs to be a good "front" man. He should make the best possible impression when he appears publicly or is being interviewed by reporters. If he can pack a punch in his answers, so much the better.

For example, General Motors President C. E. Wilson was asked whether more attention is being directed toward the use of a car than toward its appearance. His quick reply was: "Our objective is a blonde that can cook." —pp. 20, 31

* * *

IMPROVEMENT IN S. A.: In recent years hundreds of American metalworking companies lost interest in Latin American markets for good reasons. Import restrictions were imposed because of dollar shortages. Payments from customers in some South American countries were held up for long periods. The outlook was discouraging.

Today the opportunities for doing business south of the border are improving. Brazil expects to clear up her dollar arrearages by April. Conditions are better in Peru and Argentina. The dollar position of all 20 nations is improving. Already a dozen or more large American corporations are expanding their activities in Latin American republics—particularly Brazil, Mexico and Venezuela.

Advice of the experts is that if you became soured on doing business in Latin America since the war-end, take another look. It is possible that the factors which caused you to withdraw from that market have been or are being corrected. —p. 24

* * *

PROMOTE USE OF SCRAP: Members attending last week's annual convention of the Institute of Scrap Iron & Steel Inc. pondered unsavory statistics. The steel industry reduced its consumption of purchased scrap from 21.2 per cent of the total charge of metallics in 1948 to 19.1 per cent in 1949. Whereas pig iron constituted 52.8 per cent of the charge in 1948, it accounted for 54.5 per cent in 1949.

The scrap people think this is an unhealthy trend. They are going to combat it in 1950 by a three-point drive to "sell" the idea of using more scrap, to raise the quality of scrap sold and to improve the working conditions of employees in scrap yards.

Everybody will agree that it is unwise to use an inordinate proportion of pig iron when scrap is available at economic prices. All interests concerned with scrap would be better off if we could restore the orthodox scrap cycle of the prewar period. —p. 22

* * *

BETTER SHOWMANSHIP: Manufacturers are trying out new techniques in introducing new models. In recent years automobile builders have been depending upon pretentious individual public showings, such as the General Motors Motorama, rather than upon industry-wide motor shows of prewar years.

This idea is spreading into other lines of manufacture. During the past year several machine tool builders have staged individual or group presentations, partly to fill the gaps between the infrequently held general machine tool shows.

Latest example of this trend was the in-plant demonstrations of new machines by National Acme Co. for the benefit of more than 200 specially invited production and machinery purchasing executives. More and more, builders of greatly improved models will employ more positive type of showmanship, instead of clinging to the once time-honored practice of leaving it entirely to the sales force to spread the word that the company has something new to offer. —p. 23

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

COAL—Steel consumers fear they'll soon be in the middle in the cagey game the government and John L. Lewis are playing over coal (p. 17). While steel production cutbacks are still relatively minor, they will increase if the "unauthorized" coal strike continues—to the detriment of metalworking.

BUSINESS WEATHER—Immediate business prospects are still excellent for metalworking generally, despite the coal strike. Optimism of industrial furnace builders (p. 17) is tempered by the prospects of rising material and labor costs.

PENSIONS—Look closely at the Chrysler strike. It could be a foretaste of what labor will ask for in the next general round of industry negotiations. Chrysler (p. 19) offered its workers a pension and social insurance plan similar to that won at Ford and in steel, but the UAW local wants more . . . Total pension and insurance costs to U. S. Steel Corp. when more liberal plans go into effect will be $78 million yearly.

STEEL PRICES—They're still too low, say steel men in response to an investigation of the price advances, made by Senator O'Mahoney's Joint Congressional Committee on the Economic Report (p. 20). The Washington show brought a few fireworks, particularly when steel spokesmen hinted at their dislike of the whipping boy role for Congress. Steel men cited higher labor and raw material costs as the reasons why they had to raise prices . . . The investigations disclosed that U. S. Steel Corp. is not planning to build a New England steel plant, but that if and when it erects a Delaware river facility, much of the production there would go to the area.

VENEZUELAN ORE—The steel corporation also disclosed at the price investigation that it plans a costly development of ore deposits in Venezuela (p. 21). Bethlehem Steel Co. is just beginning mining operations in the eastern part of the country, south of the Orinoco river. U. S. Steel must still develop its concessions in the same general area. Its ore reserves there approximate 1 billion tons . . . Cleveland-Cliffs Iron Co. has boosted domestic ore prices 50 cents for the 1950 season.

DEFENSE BUSINESS—Even if yours is a small company, you may have a good chance to share in the $9 billion defense business to be awarded by the government or big defense contractors in the next 18 months (p. 23). Small business should get about 25 per cent of this. Total volume in defense contracts could skyrocket if the world politicial situation worsens.

OVER THE BARREL?—How are you making out in mill pricing? The barrel industry's answer (p. 28) is: "Just fair." It has been selling f.o.b. for 18 months; the shift has not encouraged competition. One government argument for delivered pricing is that it aids competition. In barrels, this method of selling, plus high freight rates, has contributed toward compartmentizing the industry and leaving it with a static physical capacity.

HERE AND THERE IN INDUSTRY—Scaife Co. is trying a triple play on high costs with a new press that in a single stroke can produce deep-drawn pressure tank parts (p. 22) . . . Machine tool builders are showing their products in private exhibits to boost sales (p. 23) . . . The federal government says Latin America is worth a second look for sales possibilities (p. 24) . . . Frederic B. Stevens Inc. and Udylite Corp., both of Detroit, plan to merge (p. 21) . . . Scrap men are launching a campaign to get the steel industry to use more scrap (p. 22) . . . Europe is bracing for a competitive economy in 1950 (p. 27) . . . Alan Wood Steel Co.'s new Conshohocken, Pa., hot-rolled strip mill will give metalworking companies in that area a new short-haul source for steel (p. 28) . . . General Motors Corp. is encouraging inter-divisional competition, partly to allay government's "big business" fears (p. 31) . . . Weirton Steel Co. has awarded a contract to Koppers Co. for a battery of 61 coke ovens; Koppers will also alter and extend Weirton's by-product and benzol plants.

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PHOTOGRAPH BY AVEDON FROM HARPER'S BAZAAR

STEEL
A PENTON PUBLICATION

Coal Outlook Scares Steel Users

Fabricating plants, noting first production cutbacks by steel producers whose fuel stocks are dwindling, fear interruptions to metal supply

What gives in coal?
That is the riddle.
If it's not solved,
We're in the middle.

THAT'S what steel users fear if the confusion in coal lasts much longer. Although steel production cutbacks thus far are relatively minor, more will be coming and their effects will quickly filter down to consumers.

A few steel users call procurement problems "as bad as anything since the end of the war," but these are still exceptional cases. Immediate supply prospects are good; it's the future that's ominous.

Steel Score—This is the score card in steel cutbacks from coal shortages, as of late last week:

Carnegie-Illinois Steel Corp.: No shutdowns yet, but it may have to curtail soon; it has five weeks' supply of coking coal in Chicago.

Inland Steel Co.: One blast furnace banked in Chicago.

Republic Steel Corp.: One blast furnace banked in Youngstown district plant; another, down for repairs, won't be lit until there's more coal.

Youngstown Sheet & Tube Co.: One blast furnace idled at Brier Hill plant.

Wheeling Steel Corp.: One blast furnace banked; all but one furnace will be idled by about Feb. 6 if the coal strike continues.

Crucible Steel Co. of America: One blast furnace and two open hearths shut down at Midland, Pa.

Sharon Steel Corp.: It will cut back blast furnace operations 25 per cent this week unless it gets more coal.

Cagey Game—Government officials describe Mr. Lewis' tactics as a "cagey game." They are confident he can send the "unauthorized" 80,000 to 90,000 strikers back to work when he wants to despite the appearance of a revolt. About 360,000 mine workers are still on a three-day week.

Mr. Lewis is scheduled to appear in a Federal District Court at Washington Feb. 1 to show cause why the three-day week is not a strike to support demands that violate the Taft-Hartely Law. National Labor Relations Board's General Counsel Robert N. Denham has filed the charges that originally were to have been heard Jan. 26. The date was moved up a week.

The government, too, is playing a waiting game. One move was the NLRB action; another was testimony by Bureau of Mines Director James Boyd before a Senate Committee that the coal dispute "imperils" the national health and safety. Under the Taft-Hartley Law, the President is empowered to seek a court order ending a strike which endangers the national welfare. Not that Mr. Truman plans immediate use of a court order. He is just preparing defenses to snare Mr. Lewis no matter where he jumps.

Business Better

But materials cost more, say industrial furnace makers. See pension demands coming

INDUSTRIAL furnace builders say business prospects are better. But materials are higher. Employment costs may rise as employers face demands for pensions.

That represents the consensus of members of the Industrial Furnace Manufacturers Association, meeting at Dearborn Inn, Dearborn, Mich., Jan. 23-24.

Twenty-six of 28 makers of factory-built furnaces and 20 of 21 builders of field-erected furnaces say first quarter business prospects are as good or better than fourth quarter. Actual production in the fourth quarter was higher than in the preced-

Robot Statistician Keeps Tab on Rejects

AN electric calculating machine that keeps a continuous check on reject rates in mass production operations is being counted upon by General Electric to cut manufacturing costs while assuring high quality of end products.

The computer, called a "quality control indicator," eliminates the usual lag in locating trouble spots on the assembly line, permits almost immediate trouble-shooting.

At left above, a woman employee demonstrates the computer. The robot statistician counts the number of items produced on assembly line at right and the number rejected. If rejects rise above a predetermined level, the needle on the meter moves to the right, calling attention of the supervisor to the trouble spot.

In practice, a battery of such indicators would be located in a central spot, away from the production lines. The computer uses various signaling devices, such as the "electric eye," to count the number of articles produced. When an inspector rejects an item, he pushes a button and the rejection is registered.

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ing three months, most companies report.

Materials Higher—C. H. Stevenson, vice president, Lindberg Engineering Co., Chicago, said his company's purchasing department checked 14 steel items with identical specifications and quantities purchased before and after the announced $4 a ton raise and found that the increases range from 6 to 23 per cent.

Lindberg now finds it necessary to accumulate steel orders to effect the greatest possible savings. But warehouses in filling larger orders often split up shipments two or three days apart "at their convenience," and they charge extras for smaller quantities.

He said he thought the tendency toward ordering larger quantities would hit smaller warehouses.

Mr. Stevenson also reported a blanket increase of 7½ per cent on all firebrick items and said it was rumored that insulating brick, stainless steel, bearings and electrical and mechanical items would be increased in the near future.

Profit Sharing, Not Pensions — Francis J. Amer, vice president, National City Bank of Cleveland, advised looking into profit-sharing trusts before adopting a pension plan for employees. He opposes government-sponsored pensions as another step toward socialism. In addition to a drive for pensions, labor unions can be expected to demand a setup permitting transfer of credits from one company to another, he said.

Trends — Harold Koch, president, Hevi Duty Electric Co., Milwaukee, predicts that larger increases in electric power capacity will induce the industry to seek added power loads, especially in medium size equipment. Henry M. Heyn, sales manager, Heat Treating Division, Surface Combustion Corp., Toledo, advises watching developments in cold forming of shell cases and use of powder metal firing bands in relation to possible effects on the furnace industry. William Adam Jr., vice president, Ajax Electric Co., Philadelphia, reports the National Security Resources Board no longer functions because President Truman has not appointed a new chairman and the industry mobilization program consequently has been suspended.

Present officers hold over until the 20th annual meeting at Hot Springs, Va., May 15-17. Association president is William E. Borbonus, president, R-S Products Co., Philadelphia. C. E. Buysee, president, Industrial Heating Corp., Detroit, replaces M. L. Snodgrass, Gas Machinery Co., Cleveland, resigned.

Profit for Warner & Swasey

A slight pick up in machine tool orders, plus improved shipments of non-machine tool items, should mean profitable operations for Warner & Swasey Co. in 1950.

Last year the Cleveland company was closed by a strike during the entire first half. During the war, the company doubled its plant facilities to meet wartime requirements for machine tools. After the war, the company undertook design and manufacture of new non-machine tool products to utilize expanded capacity.

These products, which now account for about 25 per cent of the company's total sales volume, are the Gradall excavator, pin drafting and converting machines for the textile industry and a redesigned Swiss weaving machine scheduled for commercial output sometime this year.

Good Year in Farm Machines

The farm equipment industry will have a good year in 1950 if volume is no less than 80 per cent of the 1949 level, says W. A. Roberts, executive vice president, Allis-Chalmers Mfg. Co.

Despite the anticipated industry sales decline in 1950, Allis-Chalmers expects to sell more of its leading models of farm equipment than were sold last year. The increase will come in the first part of this year.

Domestic volume of Allis-Chalmers road building machinery in 1950 should at least equal that of 1949 when the road machinery industry slumped. A large percentage of road machinery volume comes from exports which will probably be less in 1950 than last year.

Christiansen Sees Sales Hike

Christiansen Corp. and its subsidiaries expect a $12 million sales year in 1950—up 20 per cent from 1949.

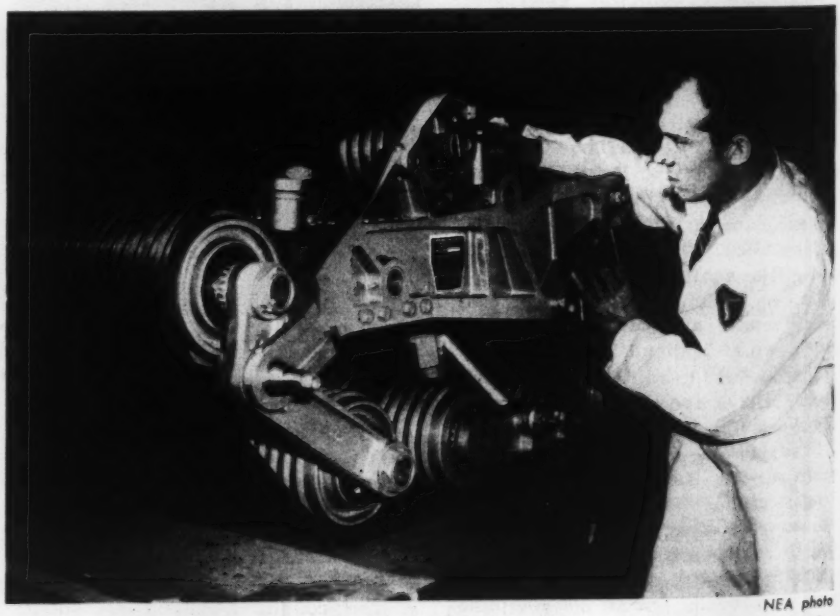
The Chicago company and subsidiaries make steel building joists, magnesium products and foundry materials like aluminum ingot, zinc base die casting alloys and magnesium bottom boards. Its optimism is based on good sales to foundries and increased building construction.

Electric Range Sales To Rise

Hotpoint Inc. thinks the electric range industry will sell 1.1 million new units in 1950, slightly better than the 1949 performance. Sales should be on a much more even keel than in 1949 when they fluctuated violently.

If 1.1 million new ranges are sold in 1949, only 20 per cent of all wired homes will have them. An additional 2 million residences will receive electricity for the first time in 1950.

Sales will be encouraged by this factor, plus low dealer inventories, veterans' insurance refund, high production, continued investment in and construction of new plants, government support of farm prices, possible tax reductions and stable prices.



NEA photo

FLYING RUNWAY: That's what Firestone calls the nose track gear of the B-50 bomber. The gear has made test landings at 160 mph under a 30,000-pound load. The rubber track is built around steel reinforcing cables. Its inside ribs fit into matched grooves of forged aluminum bogie rollers to keep the belt in position when the airplane makes taxi turns. Air hydraulic springs—oleos—maintain constant tension on the belt and provide a shock absorbing cushion that minimizes landing impact

6500 Suppliers Hit

Chrysler strike cuts off market for 60,000 tons of steel weekly, millions of dollars in parts

SOME 6500 suppliers stand to lose a lot of business if the United Auto Workers' pension strike at Chrysler continues. Chrysler buys steel, parts and supplies from that many companies scattered throughout the country. The company has been turning out nearly 6000 cars and trucks daily and was shooting for a daily rate of 7100. This would indicate steel requirements of about 60,000 tons a week.

Immediately affected by the stoppage was Briggs Mfg. Co., principal body supplier, which laid off a majority of its employees. Chrysler indicated it would not issue stop orders to other suppliers immediately but would try to build up a bank of parts.

Want New Contract — The strike started at 10 a.m. Jan. 25 when 89,000 workers walked out. Hoisting picket signs carrying the usual inane phrases — "We want pensions, not Weckler's love letters," "Millions for sick machines, nothing for sick workers," "Ford got it, steel got it, we demand it"—union spokesmen insisted the strike would not end until a completely new contract was written.

Reject $100 Offer—An offer of a $100 per month pension plan, including social security, for employees with 25 years of service had been extended by the company and immediately rejected by the UAW-CIO as inadequate, despite its parallel to the pensions granted by Ford, steel companies, rubber companies and others. Rejection was based on the union's contention it would cost the company only 3 cents an hour per employee.

It was not too clear just what the UAW wanted until a couple of days before the strike deadline when a proposal was cooked up for a "10-cent package," to be used either to finance a pension and health insurance plan, administered jointly by company and union, or to be a flat wage increase. It was something that the rank-and-file of the union could really sink its teeth into and full-page newspaper ads were released to outline the union's position and generate popular support for a walkout.

Age Average Low—Average age of Chrysler workers is considerably less than at Ford, for example, so it would be possible for the company to finance $100 monthly pensions at somewhat less cost. Conversely, a 10-cent per hour allocation for each employee would buy more than $100 a month in pensions, so the Chrysler workers would be winning something better than the Ford or steel plans. Of the 89,000 Chrysler hourly rated employees, an estimated 4000 are age 60 or over, while at Ford 13,000 have reached this age.

Threaten Long Strike—The UAW claims to be financially prepared for a long strike if necessary. After three weeks, other local members can be assessed $1 weekly for a strike fund, continuously up to a limit of 12 weeks. With close to a million members, this could provide benefits up to $12 million to support the cause of Chrysler strikers.

Union sources said 21,000 office, maintenance and power house employees would be permitted to pass picket lines at the 29 struck plants. However, it is usually the case that as a major strike of this character wears on, there are eventually efforts to interfere with admission of these essential employees, mainly to create "incidents" which might bring the strike to a head. Striking employees are required to serve one hour out of eight on picket lines and carry picket cards which must be punched to certify such service. The rule is enforced only loosely, most employees just stay home and out of the way.

Check the Oil?

That perennial question from gas station attendants may be obsolete soon, thanks to fluorine chemistry. Prof. Earl T. McBee, Purdue University, says automobiles may never need change their oil as the result of properties of fluorine compounds.

"With the rapidly increasing knowledge of fluorine chemistry, the production of stable coolants, lubricants, hydraulic fluids and lubricant additives can be expected," he says. "Engine oil and other lubricants will require only infrequent inspection." Only the production cost of fluorinated materials remains as a barrier to large-scale commercial applications for this class of substances.

Autos in Salesmen's Market

The automotive industry is in neither a buyers' nor a sellers' market. It faces a salesmen's market, says J. W. Burke, manager of the truck department for General Motors Corp.'s Chevrolet Division. His department in 1949 set a new sales record with distribution of 350,521 trucks.

The most costly factor in automotive selling in the past, says Mr. Burke, has been rapid turnover of personnel. Costs can be reduced if proper training and supervision are observed in developing a sales force.

"Auto business is to be had," says Mr. Burke. "Good salesmanship can get it."

U. S. Steel Pensions

To cost $55 million more in 1950. Social insurance bill to rise $13 million

NEW social insurance and pensions programs to be put into effect by United States Steel Corp. will cost $67.5 million more annually than its present plans. Current insurance and pension costs are $10.5 million. Total costs when the more liberal plans go into effect will be $78 million yearly.

U. S. Steel will use a minimum funding basis. This means that future service costs for pension will be paid as a level percentage of payroll. For U. S. Steel, this figures out to 4.79 per cent of payroll, or $42.6 million a year.

Only Interest on Past Service—On past service costs, the corporation will pay only the interest. This is the basis suggested by the United Steelworkers. The total past service cost amounts to $560 million. But the corporation has a fund of $64 million accrued under its old plan. It will pay interest on the difference, or $496 million.

The annual amount needed to meet the interest requirements will be $12.4 million. Thus the total cost of the new noncontributory pension plan will be $55 million a year. But costs of the corporation's present contributory plan will drop from $4.5 million to $4 million, making a net increase in pension costs of $54.5 million a year.

Insurance Costs $14 Million—New social insurance program will raise the corporation's costs by $13 million a year, to a total of $14 million annually for social insurance.

The union contract requires that the new pension benefits apply to all employees who have retired since Mar. 1, 1948. The corporation will extend these benefits to employees who retired before Mar. 1, 1948, as a matter of equity.

The corporation proposes to continue its contributory pension program, in effect since 1940, with future participation limited to those employees not entitled to overtime pay.

UNIVERSITY OF MICHIGAN LIBRARIES

Prices Still Too Low, Say Steel Men

December increase held inadequate to offset higher social security costs. Further advances hinted by industry executives before congressional committee

STEEL PRICES should be higher than they are now. And some additional price increases are contemplated.

That's the backfire that burst last week upon the Joint Congressional Committee on the Economic Report which had called steel companies on the carpet to explain "how come" the recent increases in steel prices.

While some of the explanations brought out new facts, the quizzing of steel industry officials is an old story. The steel industry has time and again found itself in the role of whipping boy, observers recall.

Second Inquiry Coming—But why pick on it all the time? they ask, noting that in February another group—the Celler Monopoly Subcommittee—will begin an investigation (see page 26) of the recent increase in steel prices. Are these hearings merely to impress voters that this Congress is on the job? Do the investigations reflect an anti-big-business attitude of Congress and the administration? Or are they part of a trend toward socialism and the harassment of private enterprise?

The answers were varied, but not unemphatic.

Citing increased costs of replacing worn-out plant and equipment, higher costs of materials and rising cost of labor, steel company executives at last week's hearings asserted recent increases in steel prices are inadequate to pay the bill.

Stainless May Rise—Says Edward J. Hanley, executive vice president, Allegheny Ludlum Steel Corp.: "The price relief we have thus far obtained is by no means enough. We are presently considering an increase in the price of stainless steel."

From Adm. Ben Moreell, chairman and president, Jones & Laughlin Steel Corp., comes this statement: "We do not believe that steel prices are too high. We believe they should be still higher to keep a vital industry in step with our expanding economy."

Compared with prices of other major groups of commodities, steel prices "are not high; they are low," says Enders M. Voorhees, chairman of United States Steel Corp.'s finance committee. "It is a fact that advances in the prices of steel products have been markedly laggard rather than in the vanguard of the great price inflation during the last ten years." Steel prices, he declares, would have to be increased by 35 to 40 per cent to restore their prewar parity with farm prices, by 12 to 16 per cent to restore their prewar parity with wholesale prices in general.

Investors Reluctant—If the steel industry is as opulent as that industry's critics claim, the investing public certainly would be eager to own steel stocks and would bid up the prices of stocks in the market, observes Ernest T. Weir, chairman, National Steel Corp. Says Mr. Weir: "Actually, any time you care to place an order, you can buy the stock of any steel company for less than its book value—and based on the low original cost, not the present replacement cost. The investing public does not think much of the profit potential of the steel industry, and it is apparent that the industry would have a difficult time getting investment capital."

Doesn't Pay for Pensions — Mr. Voorhees pointed out that U. S. Steel's cost increases in 1949 total $76.2 million, of which $70.9 million stems from pensions, insurance and old age benefits tax. The $76.2 million increase amounts to $4.17 per ton of the corporation's yearly shipments of 18,250,000 net tons of steel shipped to the public. The December, 1949, price increase will raise $69.7 million, or an average of $3.82 per ton, an amount insufficient to cover the additional costs, explains Mr. Voorhees. Surveying possibilities for recovering the $76.2 million, he points out that there was really no place to turn but to the customers for more money.

Wasting Its Assets—Even with the increases the steel consumer is getting more than steel for his money. He's getting part of the assets of the steel industry, believes Admiral Moreell, who states: "To me it appears that steel prices have so lagged behind other prices that at present the steel industry is wasting its assets. We are tossing them in for free with every ton of steel sold. The reason is this: We are not charging enough for our products to pay the huge costs of rehabilitating and improving plants to keep pace with America."

Plug for Tax Revision—Appearance before the congressional committee was utilized by the steel industry defenders as an opportunity to put in a plug for revision of federal tax laws to permit industry to write-off equipment costs in shorter time and on a replacement cost basis. "It is only for expanded capacity that there is justification for borrowing or new capital," Mr. Voorhees declares. "Under present taxing policies it is difficult to adhere to this principle because the government taxes as profit at 40 per cent the difference between depreciation on original cost and depreciation calculated on a replacement basis or on an accelerated basis. As a result many companies have found it necessary to borrow merely to replace facilities which are wearing out, thereby diluting the equity of present investors."

More Steel for New England

U. S. Steel will be in a better position to supply steel products to the New England markets if and when it builds an integrated steel mill on the recently acquired site on the Delaware river, near Morristown, Pa. But U. S. Steel is not considering building a new plant in New England.

This was the word given the O'Mahoney committee last week by Ben Fairless. Mr. Fairless said the corporation considered New England as a possible site for a new plant but discarded it in favor of the Philadelphia-Trenton area. The decision is based on markets, raw materials and financial factors.

He points out that U. S. Steel has 250,000 tons of open-hearth capacity at Worcester, Mass., plus rod, wire, cable, and cold-rolled strip capacity. It also has wire and wire rope capacity at New Haven, Conn., and a steel warehouse in Boston.

He emphasized U. S. Steel is not opposed to a new integrated plant in New England, if accomplished by private enterprise.

Should a plant be built there, he says, U. S. Steel will be willing to supply ore at regular market prices.

K-F Builds in Oregon

KAISER-Frazer Corp. is decentralizing and will begin auto assemblies at a new $350,000 Portland, Oreg., plant soon after Apr. 30. The facility is being built by Union Pacific Railroad which will lease it to K-F.

Nash To Maintain Coast Output

NASH Division of Nash-Kelvinator Corp. says the current rate of production at its El Segundo, Calif., assembly plant will be maintained and possibly increased soon. A new small car, the "5010 series," now being produced in limited quantity at the division's main Kenosha, Wis., plant, may go into production at El Segundo next summer.

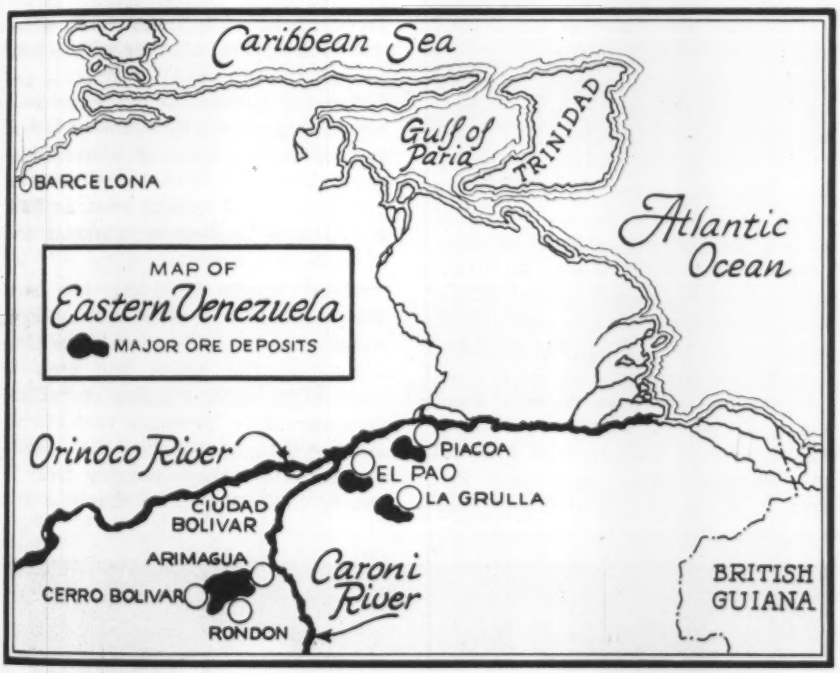
Venezuela To Supply Rich Ores for U. S. Coastal Plants

THE TWO largest steel companies in America—U. S. Steel Corp. and Bethlehem Steel Co.—will get much of their future iron ore from Venezuela. That was revealed by John C. Munson, vice president—raw materials for U. S. Steel Corp., who spoke at the steel price hearings, Washington.

He says that one reason why the corporation had to boost its steel prices is the high cost of raw materials, including the expensive development of the Venezuelan properties.

Major Ore Deposits—U. S. Steel has a 75,000-acre concession from Iron Mines Co. of Venezuela, a Bethlehem subsidiary. It is taken by trucks and conveyor belt to crushers, then to the railroad, finally to Palua which has storage capacity for 35,000 tons. A 36-hour haul by river brings the ore to the gulf of Paria and a transshipping point, Puerto de Hierro on the southern shore of the Paria peninsula, across from Trinidad. This port is still being developed.

U. S. Steel began its Venezuelan exploration project in 1945 and now has organized Orinoco Mining Co. to develop its concessions. The most important is at Cerro Bolivar, about 90



Venezuelan government in the Cerro Bolivar-Arimagua-Rondon area (see map) and smaller concessions at La Grulla and Piacoa. Bethlehem has a 20,000-acre concession at El Pao and is just beginning production. Ores range up to 72 per cent iron content; average shipping grade should exceed 60 per cent.

Eastern Venezuela was explored in the late 1920s. Deposits of high-grade ore were found, then believed to approximate 50-75 million tons. This is the El Pao deposit now being worked by Bethlehem. El Pao is an iron mountain 36 miles south of the Orinoco river. Bethlehem began developing this area in 1941 for open pit mining. Today it has a standard gage railroad and a dirt highway between thriving communities at El Pao and at Palua, a river camp on the Orinoco.

Halfway Up Mountain—Ore is mined halfway up the mountain by miles south of Ciudad Bolivar, a provincial capital.

The corporation's ore reserves total 1 billion tons. Within four years, it plans to be mining 10 million tons annually. Eventually, this will be boosted to 15 million tons yearly. Ore will be moved by rail to the Orinoco. The river must be dredged—at a cost of $18 million—to get ore 170 miles to tidewater. An alternate method would be to freight the ore all the way to the coast by rail.

Iron Ore Price Up 50 Cents

Price of Lake Superior iron ore sold by Cleveland-Cliffs Iron Co., Cleveland, for delivery in 1950 is up 50 cents a ton over 1949.

New prices are: Old range bessemer, $8.10; old range nonbessemer, $7.95; Mesabi bessemer, $7.85; Mesabi nonbessemer, $7.70; and high phosphorus, $7.70.

The increases are attributed to rises in labor costs, including pensions and social benefits, and the necessity of relying more and more on high-cost mines and methods of getting ore now that open-pit mines have been heavily depleted.

Stevens, Udylite Plan Merger

FREDERIC B. Stevens Inc. and Udylite Corp., both of Detroit, will merge, provided the stockholders approve.

Stevens was founded 65 years ago and has plants in Detroit, New Haven, Conn., and Buffalo, wholly owned subsidiaries in Windsor, Ont., and Springfield, O., and offices and warehouses in principal cities. The merger plan calls for Stevens to continue operations as a division of Udylite. Stevens makes continuous barrel plating equipment, foundry facings, equipment, supplies and polishing compounds. W. J. Cluff is president.

Udylite was organized in Kokomo, Ind., in 1927 by Marvin Udy to exploit his process of rustproofing metals by electroplating. Transfer to Detroit came in 1934 and incorporation as Udylite Corp. in 1939. Products include motor-generator sets, switches, rectifiers, rheostats, plating supplies, polishing, buffing and plating equipment, tanks and tank linings, plating barrels and anodes. L. K. Lindahl is president.

Plan 24-Inch TV Tube

RCA Victor shortly will introduce a 24-inch television tube—largest yet—and thus adding another competitive element in the battle for markets under way among television producers. Introduction of rectangular tubes already is proving a headache for competitors tooled up for round tubes who cannot readily change over. Fused, glass-to-stainless steel tubes have been reduced in weight as much as 75 per cent compared with all-glass types.

Sylvania Expands in California

SYLVANIA Electric Products Inc., New York, manufacturer of electronic equipment, television sets and components and photographic supplies, will expand in California.

The company is investigating warehouse facilities in the San Francisco area, and later this year will open a plant in or near San Francisco for the manufacture of fluorescent lighting fixtures. Construction also was started this month on a warehouse and assembly plant at Vernon, a suburb of Los Angeles.

The company will begin marketing its television sets on the West Coast in February.

UNIVERSITY OF MICHIGAN LIBRARIES

Scrapping for Business

Dealers and brokers want steel industry, foundries to use more purchased scrap

IF YOUR metalworking plant produces much scrap you'll most likely be in sympathy with one of this year's projects of the scrap industry.

It's a campaign to persuade the steel industry to use more scrap. And the more scrap that's used the better should be the chances for a good market for you.

Last year the steel industry cut its usage of purchased scrap to 19.1 per cent of the total charge of metallics. The figure for 1948 was 21.2 per cent. Although pig iron constituted only 52.8 per cent of the charge in 1948 it amounted to 54.5 per cent in 1949. The remainder of the charge in both years was home scrap.

Frowning on this trend, Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel Inc., declared at the group's annual convention in Washington last week:

"We believe that the burden of logic is that the proportion of purchased scrap should have increased and the proportion of pig iron decreased in 1949 in order both to conserve our diminishing resources of iron ore and to insure a continuance of a sound scrap industry, in the interest of the national economy."

"Use More Scrap"—Convinced that the 1949 pattern of scrap consumption should be reversed, the institute has a "use more scrap" campaign as one of its three projects for 1950. Other two projects are: Raising of quality of scrap sold to consumer; improved working conditions.

Elaborating on the 1949 record, Mr. Barringer believes there should be only "a minimum reliance upon pig iron, whose production wastes away our resources of iron ore, so long as an adequate flow of ferrous scrap of acceptable quality is available at an economic price. None of these three qualifications," he believes, "is unattainable if there is mutual understanding and co-operation between the two industries and there is a free play of economic law."

Conservation Job — "Few industries," says Mr. Barringer, "have so powerful a sales argument as is available to the scrap industry in the form of the job of conservation it can do. And equally potent are the arguments for the maintenance of a strong and widespread scrap industry to provide a satisfactory flow of scrap in time of peace and susceptible of rapid expansion in time of war.

"The scrap industry can't be turned on and off like a water faucet. The industry cannot be pressed to produce one year but drawn upon only lightly the next year. Suggestions that it is the normal function of the industry to accumulate stocks are not entirely a substitute for orders."

New Officers—Elected at the convention to institute offices for 1950 are: President, Stanley M. Kaplan of M. S. Kaplan Co., Chicago; first vice president, Ralph E. Abalon of Luria Bros. & Co. Inc., New York; second vice president, Clarence C. Cohen of I. J. Cohen & Co., Kansas City, Kans.; secretary, M. L. Chase of Luntz Iron & Steel Co., Canton, O.; and treasurer, Samuel G. Keywell of Samuel G. Keywell Co. Inc., Detroit.

Re-elected as directors are Harold Weinstein, East Chicago, Ind., Albert Levinson, Los Angeles, and Marvin S. Plant, Baltimore. New directors are Sidney Byer, Houston, David Holub, Youngstown, and Leonard Krieger, Pittsburgh.

Also announced at the convention were winners of the institute's 1949 scrap yard safety contest. Ratings among dealers employing 11 or more persons are: First place, M. Bloch & Co., Seattle; second, Joseph Kroot Co., Columbus, Ind.; and third, Abrams Metals Co., Philadelphia. Among dealers employing ten or fewer persons the winners are: First place, J. Alpert Iron Co., Chelsea, Mass.; second, Eastern Iron & Metal Co., Sherman, Tex.; and third, Fell Iron & Metal Co., Bloomington, Ind.

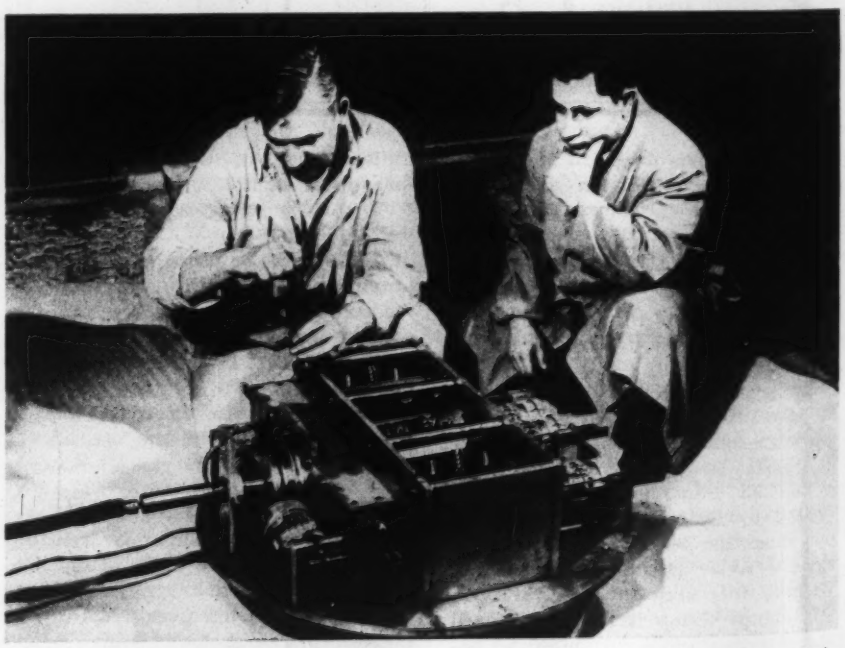
Scaife Tries Triple Play on Costs

A TRIPLE play against high costs is being tried by Scaife Co., Oakmont, Pa. Its new press to produce deep-drawn pressure-tank parts in a single stroke is designed to save time, handling costs and equipment expense.

A deep-drawn part usually is pressed several times in a series of dies—with intermediate annealing to relieve stresses. The Scaife press will do it all at once. Scaife engineers had the original idea; Hydraulic Press Mfg. Co., Mt. Gilead, O., built the press; Schnell Tool & Die Co., Salem, O., designed and made the intricate dies.

The $250,000 press is a 750-ton unit 28 feet high. Each stroke of the press forms a cylinder half, which will be welded to another half to form a complete liquefied petroleum gas cylinder. A circular 12 gage steel blank 38¼ inches in diameter is first formed into a cup of conventional proportions and then literally turned inside out by a second ram, to form a cup 14½ inches in diameter and 24½ inches deep.

What Scaife is doing has been done before, but only with a light metal and on small pieces. The company plans to adapt the press to most of its other cupping operations. It makes steel pressure tanks in all sizes. With appropriate dies, Scaife estimates that cups ranging from 10 inches to 30 inches in diameter and



EARTH-SHAKING: The Rutgers Research unit, with the New Jersey State Highway Department and the U.S. Public Roads Administration, seeks to pre-settle highway foundations in study at the engineering laboratories of Rutgers University. Two men are at a machine that simulates vehicular vibrations in shaking and settling soil

from 1 foot to 6 feet long can be turned out on a production basis.

Armco Steel Corp.'s subsidiary, Sheffield Steel Corp., and Weatherhead Co. of Cleveland have ordered similar presses. One drawback to the process is that it is costly to change dies. But if changes are rare, the method is a money-saver; 144 pieces can be turned out an hour.

Small Business Shares

In the military budget dollar. Firms employing fewer than 500 get about 25 per cent

SMALL BUSINESS is due for a large chunk of the military budget dollar this year.

And if things go as they did in the last fiscal year, companies employing fewer than 500 persons should get about one-fourth of the $9 billion that will be spent in the next 18 months. Of that sum $6.8 billion will be for U. S. armed forces equipment in fiscal 1951.

Ordnance orders for fiscal 1950 are still being placed since there is generally a three to six months' lag between the time money is appropriated and when contracts are let.

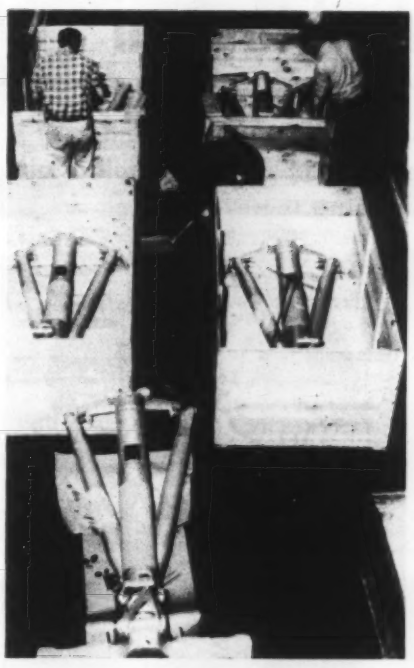
Reserves as usual have been set aside from current military appropriations; the appropriations are about $14 billion, roughly the same as they were in fiscal 1949. Many plants are still working on 1949 assignments; since 1950 orders are still being placed, it looks like another busy year for military-goods producers. What will they make? Everything from doorknobs to airplanes.

Foreign Aid Boosts Total — The $2017 million appropriation for aircraft in 1951 lops off $165 million from 1950's $2182 million. But foreign aid orders will help make up the "deficit:" American manufacturers are sure to handle some of the foreign aid orders. Guided missiles and research and development will help aircraft manufacturers, too.

The shadows of Air Force planes flit across present and future military outlay. The Aircraft Industries Association says 1950 airplane output should exceed 1949's. Heavy bombers, it says, should account for the bulk of the increase.

Any businessman who wants to sell to the Defense Department may telephone, write, wire or visit the military procurement information center at the Pentagon. There they can get aid in finding firms in the market for their kinds of products.

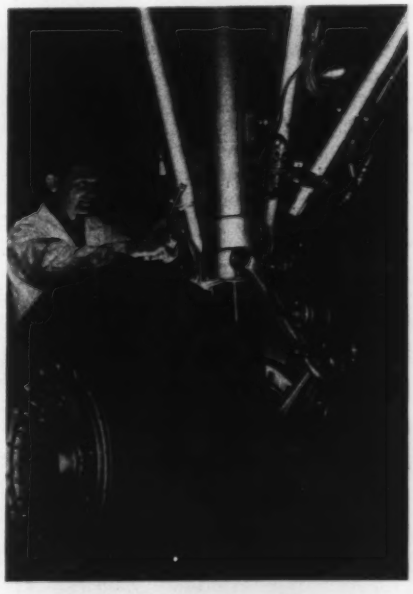
Subcontracts for Many — Many small firms prefer to do business with the government by subcontracting from large manufacturers. In building its C-119 "Flying Boxcar" the Fairchild Aircraft Division in Hagerstown, Md., spends about 14 per cent of its procurement dollars with about 30 small firms, including Cleveland Pneumatic Tool Co. It makes landing struts for the C-119.



PACKING C-119 GEAR STRUTS
. . . at Cleveland Pneumatic Tool Co.

Douglas Declares Dividend

Douglas Aircraft Co. Inc., Santa Monica, Calif., has declared an extra dividend of $1.25 from earnings in the fiscal year ended last Nov. 30 and the regular quarterly dividend of $1.25, both payable Feb. 21.



FINISHED PRODUCT ASSEMBLED
. . . at Fairchild Hagerstown plant

Private Shows Sell Machines

PRIVATE showings of new machine tools are increasing. No longer are the builders content to engineer and construct a better machine and bide their time until the sales force spreads the word. New products are introduced at private shows staged with a flourish. Except in size they differ slightly from the model showings of automobile builders.

Latest development in the growing trend is the "in-plant" showing staged by National Acme Co., Cleveland, Jan. 16-20. More than 200 production and machinery purchasing executives from a selected coast-to-coast list attended. Company officials say a gratifying amount of new business resulted directly from this showing, and the interest displayed by others attending should pay dividends in the future.

Main attraction at the showing was a completely new single spindle automatic demonstrating top-flight carbide tool performance on work 4¾ inches in diameter. Tooled up on a customer's job — tooling included carbide-tipped drills — the machine produced parts more than 10 times as fast as earlier models of comparable machines.

Other working models included: An eight-spindle chucking machine with hydraulic chucking mechanism; a 1⅝-inch, eight-spindle bar automatic turning out trunnion bearings in 9.5 seconds each; a 9/16-inch, six-spindle automatic with pickup and transfer attachment for finishing both ends of threaded studs; a roll threading and forming machine; a vertical pipe coupling tapping machine with automatic loader and work reversing mechanism; and a 12-inch, single spindle chucking automatic. The last mentioned machine taper bores and finishes each end of 2 inch line steel pipe couplings at 1200 surface feet per minute.

Bethlehem Expands Sparrows Pt.

BETHLEHEM Steel Co. will build a $30 million addition at Sparrows Point, Md., to increase capacity by 900,000 tons annually for tin plate, hot and cold-rolled and galvanized sheets. Contracts are now being let for the work. Completion will require about 15 months, and facilities will be ready by the second quarter of 1951.

Bethlehem will draw on Bethlehem and Steelton, Pa., plants for steel. At both these points there is an excess of capacity. Ingots will be converted into slabs and then sent to Sparrows Point. New work will include a 68-inch cold mill and an additional stand to the 58-inch mill.

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Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

The outlook for again doing business south of the border is improving. If you lost interest in Latin America, look again. Some big companies are expanding there

TAKE ANOTHER LOOK. That, in effect, is what informed government officials are saying to manufacturers who lost interest in Latin American business after the war.

U. S. businessmen did have a good reason for not looking south of the border: Import restrictions dictated by dollar shortages. And although our southern neighbors are still plagued with inflation and other problems the outlook for again doing business with them is improving.

More than just a few of the larger U. S. firms believe that. And they're doing something about it. Some of the larger firms expanding their activities with Latin American republics—particularly Brazil, Mexico and Venezuela—are:

International General Electric, Westinghouse International, American & Foreign Power, Bethlehem Steel, U. S. Steel, Rheem Mfg. Co., Revere Copper & Brass, General Motors, Sears, Roebuck & Co., Anderson, Clayton & Co., and Gillette Safety Razor Co.

Some Cleaning Up of Dollar Arrearages—The dollar position of the 20 nations is improving. Brazil, despite buying from us to the extent of nearly $500 million in 1949, expects to clean up her dollar arrearages by April at the latest. Argentina is making progress in that direction. Peru has made substantial progress toward free exchange. (The higher prices you have been paying for coffee, wool and hides have been correcting Latin American dollar shortages.)

Exports, Imports Begin To Balance—The export-import balance is more satisfactory. In 1947 our merchandise trade with Latin America came to $2,167,590,000 in imports and $3,857,817,000 in exports. In 1948 imports were $2,353,972,000 and exports $3,160,753,000. In the first 11 months of 1949 our imports were $2,083,266,000 and our exports $2,495,635,000. Indications are that heavy imports of Argentine wool, hides and some other products in December will narrow the gap considerably. These figures, incidentally, do not include substantial imports of gold and silver, and they do not include money spent by U. S. tourists. Mexico, which benefits most from such spending, took in an estimated $150 million from Yankee travelers in 1949.

LATIN AMERICAN BUSINESS

. . . worth a second look

Another factor favorable to U. S. exporters is the slowness of the European countries in regaining Latin American markets. European business hasn't much of a surplus for export after meeting home needs. So, while U. S. businessmen supplied 38 per cent of the Latin American imports in 1938, they supplied 64 percent in 1947, 58 per cent in 1948 and an estimated 55 per cent in 1949. Government men expect the U. S. will continue to supply about 55 per cent of Latin American imports for some time.

Assistance from Commerce Field Offices—Much is being done by the government to encourage trade with Latin America. Interested manufacturers and businessmen can get a lot of advice and assistance by calling on Commerce Department field offices. Reports available there contain helpful information, much of which is of a character that precludes general publication. Commerce's Office of International Trade has in preparation an up-to-date report that will show the dollar exchange position of each country, and the import restrictions in effect. It is to be published shortly.

Improvement of Trading Atmosphere—The State Department is also at work on a campaign to improve the trading and investment atmosphere. Officials are working toward the removal of restrictions, barriers and discriminations. They achieved their first result in the recent signing of a treaty of friendship, commerce and economic development with Uruguay. It is still to be ratified by both countries. Conversations aimed at negotiation of other treaties are under way.

Checking Diplomatic, Trade Activities—Actively pushing the program is E. G. Miller, assistant secretary of state for inter-American affairs. At Havana, Jan. 18-20, he held a conference with all U. S. representatives in the Caribbean area to check on our diplomatic and trade activities. He is following up with visits to the various countries in the area to explore prospects for closer co-operation. He will hold a similar conference at Rio de Janeiro, Mar. 1-3, with all U. S. representatives in the east coast countries and visit the governments of the countries in that group.

In Congress, the State Department is pushing a bill to provide Export-Import Bank guarantees against certain risks involved in foreign investment. The measure would also help trade.

Another bill would have the Export-Import Bank guarantee dollar payments for exports to western hemisphere countries. The latest thinking is such a law might tempt some of the countries to let American exporters do their collecting from Uncle Sam. So the probability is it won't pass.

Ball Still Rolling

LATEST ADDITION to newsletters that attempt to keep subscribers informed about what is going on behind the scenes in Washington is the Joe Ball Labor Letter.

Conducted by the former Republican senator from Minnesota whose unseating was attributed largely to his part in writing most of the Taft-Hartley Act, it is full of pungent and informative comment carrying the usual injunction: "Confidential and may not be quoted except by special permission." Publisher of the Joe Ball letter is the National Research Bureau Inc., 415 North Dearborn St., Chicago 10.

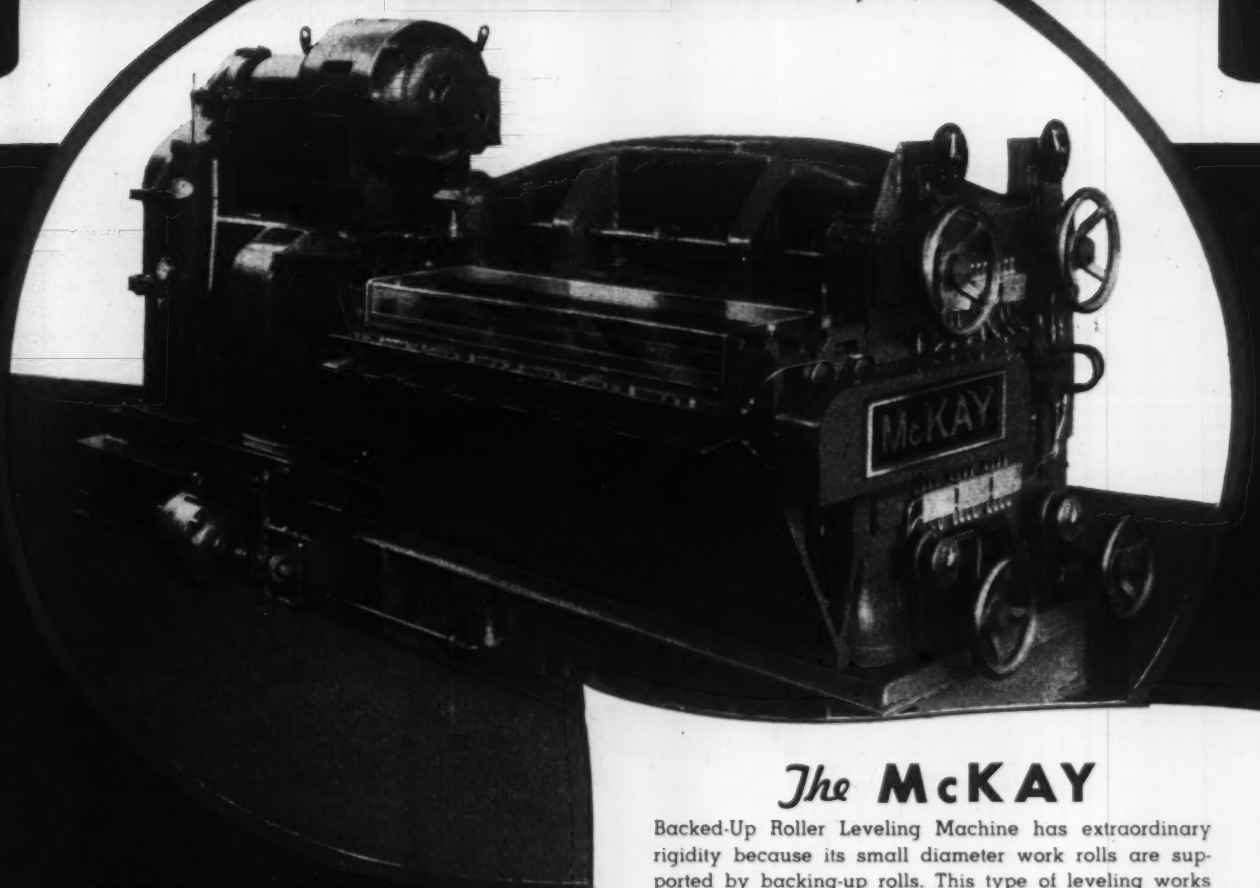
More Grain Bins in Offing

A SECOND grain storage bin program by Commodity Credit Corp. is in the offing.

It could involve as much as 100,000 net tons of galvanized sheets, both corrugated and flat. While CCC will need capacity to store about 450 million bushels of grain to be delivered

McKAY

BACKED-UP ROLLER LEVELERS



The McKAY

Backed-Up Roller Leveling Machine has extraordinary rigidity because its small diameter work rolls are supported by backing-up rolls. This type of leveling works the sheet more thoroughly.

Sheets processed on this type of leveler are strain relieved to a greater extent and have far superior stamping and drawing qualities than those processed by the ordinary leveler.

STANDARD FEATURES

mpact design reduces required or space.

l adjustments are readily ac- ssible to the operator.

ourate indicating dials are ovided for the screw downs.

loy steel helical gears are used throughout all gears fully enclosed and running in oil.

Drive is through improved type McKay universal couplings.

Rugged construction insures continuous performance and low maintenance.

OPTIONAL FEATURES

e shot lubrication system.

ushing rolls for cleaning strip with built-in reservoir and ray system for solvent.

Entry or exit pinch rolls.

Sheet oiling system (on exit side of machine) with integral tank and oil distributing head.

The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

PERFORMANCE . . RUGGEDNESS . . PRECISION AND SAFETY

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during the spring months, it has idle available capacity of only about 40 million bushels. It is giving private warehousing interests until Feb. 15 to report on the number of bushels they can accommodate, after which CCC will promptly procure the needed additional bins. Galvanized steel is the preferred material for construction of such facilities for CCC.

Five Sizable Loans Made

FIVE SIZABLE new loans of interest to the metals industry are reported by Reconstruction Finance Corp.:

To Firth Sterling Steel & Carbide Corp., McKeesport, Pa., $1.5 million, for 10 years, for additional facilities, debt payment and working capital.

To Kerotest Mfg. Co., Pittsburgh, manufacturer of valves for oil refineries, etc., $1.2 million, for 6 years, for working capital and debt payment.

To Reo Motors Inc., Lansing, Mich., manufacturer of trucks, coaches and power lawn mowers, $2 million, for 10 months, for working capital.

To National Union Radio Corp., Orange, N. J., manufacturer of electronic tubes, $1.4 million, for eight years, for purchase of equipment, debt payment and working capital.

To Lumaghi Coal Co., St. Louis, $625,000, for 5 years, for purchase of bituminous coal mining equipment.

Date with Big Steel: Feb. 13

THE CELLER Monopoly Subcommittee's investigation of the economic facts behind the recent increases in steel prices will probably start Feb. 13.

The staff has been gathering available information and is studying the testimony produced at the hearings of the Joint Committee on the Economic Report on the same subject. The Celler group, which in previous hearings has been critical of the United States Steel Corp. as a so-called industrial "giant," is expected to ask penetrating questions.

The subcommittee also plans to hold hearings "soon" on a bill that would raise from $5000 to $50,000 the maximum fine for antitrust law violations. Rep. Francis E. Walter (Dem., Pa.), who introduced the bill, says the larger fine should tend to discourage such violations.

Capital Compass

DR. R. C. SWAIN, vice president, American Cyanamid Co., Stamford, Conn., is the new chairman of the Research and Development Board's Committee on Chemical Warfare, succeeding Dr. W. Albert Noyes Jr., professor of chemistry, University of Rochester, Rochester, N. Y. . . . Sidney K. Wolf, International Telephone and Telegraph Co., New York, and a colonel in the Air Force during World War II, was appointed executive director of the Munitions Board Joint Electronics Committee. . . . Blackwell Smith, Princeton, N. J., John F. Skillman, Toledo, O., and George N. McClusky, Upland, Calif., were appointed consultants to integrate mobilization planning for emergency controls on production and distribution, under Oscar L. Endler, acting director, Office of Economic Management, National Security Resources Board. . . . Captain Arleigh A. Burke has been appointed Navy secretary of the Research and Development Board.

Vital Statistics on Industry

THOSE VITAL business statistics, the Commerce Department's annual and quarterly figures for national income and national product, are to be made more useful in 1950.

The Office of Business Economics, which compiles them, is adding some refinements to cast more light on economic problems. For example, everybody knows that the big postwar rise in the value of U. S. national output contains a certain amount of wind due to price inflation—but nobody knows just how much.

VALUE OF U. S. NATIONAL PRODUCT

. . . a certain amount of wind

This year OBE hopes to come up with an answer. New tabulations will show what the yearly national product would be worth at prewar (1939) prices.

They will show exactly what happened to the overall price level of final products. Figures also are being broken out of these totals to cover specific kinds of final products—food, clothing and capital goods. To be included are total sales of such products to consumers, business and government. All estimates will run back to 1929 and forward to date.

Another set of statistics that OBE is preparing for business use will show total personal income in each of the 48 states and for the U. S. as a whole, by family income brackets.

Their purpose is to show the location and sources of buying power as an aid to such things as the planning of sales efforts, the pricing of consumer goods, the selection of plant locations. Twenty - year regional trends are to be revealed by the study of incomes by states.

Another type of income-bracket research has been undertaken by OBE for the first time. It covers the postwar incomes of professional men: A survey of dentists is being wound up for release in January. Reports on lawyers and doctors will follow. The studies will show income variation from year to year back to 1929, and from city to city, as well as by type of clientele, number of years in practice, etc. Besides helping round out the complete picture of how the national income is earned, these studies are designed to help professional men select promising locations and otherwise plan their careers.

Orthonol Being Produced

ORTHONOL, the Navy's recently developed soft magnetic alloy containing 50 per cent nickel and 50 per cent iron, is being produced by six manufacturers.

They are Allegheny Ludlum Steel Corp., Pittsburgh, Armco Steel Corp., Middletown, O., Westinghouse Electric Corp., East Pittsburgh, Pa., Magnetics Inc., Butler, Pa., Arnold Engineering Co., Chicago, and ITE Circuit Breaker Co., Philadelphia, all producing and selling under their their own individual brand names.

The new alloy, developed by Dr. G. W. Elmen from the German Permenorm, is winning wide application in the rectification of electrical current and in magnetic amplifiers. The armed services are finding new uses, particularly in the form of coils which serve as nondestructible replacements for fragile electronic tubes in mines and other types of ordnance.

The Navy is working on some new applications classed as military secrets.

Europe Braces for Competitive Economy

What will happen this year as sales become more difficult? Ruinous competition? Cartels? Reasonable competition? Factors favoring each are in play

WESTERN European nations are like jealous suitors in their fierce competitive struggle to woo the buyers' market.

What's going to happen in 1950 as sales become more difficult than ever? Ruinous competition? International cartelization? Reasonable competition? Factors supporting any three of these possibilities are in play today.

Ruinous Competition—The steel export battle in Europe is developing into a dog fight. Spurred by the specter of an 8 million-ton overproduction by the time ERP ends, steel exporters are getting desperate and have begun cutting prices. General industrial production rose to alltime highs in 1949, and output will be even greater this year. Take automobiles. Britain, France and Germany will boost assemblies in 1950, but the export market is nearly saturated.

International Cartelization — The cartel movement is strong in Western Europe because of the dangers of ruinous competition. In a tooth and nail price war, an industrialist may find himself in the predicament of the man who, trying to saw off the legs evenly on a kitchen chair, hacked away until the legs were completely gone. Steelmen in all countries have flirted with the cartel idea. If it weren't for U. S. influence, one or two would be operating now. As it is, no successful one has yet been formed.

Moderate Competition — Powerful U. S. pressure is being brought to bear on this course. Real economic unity is on the distant horizon, but immediate patchwork measures may help. At a Paris meeting of French, Italian and Benelux representatives, it was decided to reduce import quotas by 60 per cent to lower trade barriers.

The proposal, which was made at the suggestion of ECA Administrator Paul Hoffman, will be presented before the European Marshall Plan Council, to meet Feb. 1. The council will also consider adoption of other provisions in the tentative scheme for a five-nation trade bloc of France, Italy and Benelux.

Western Europe is also doing something on its own to further moderate competition. It has scheduled an unusual number of fairs and exhibitions for 1950 (see the listing on this page).

NEA photo

ELECTIONEERING: An organizing secretary of the Young Conservatives arranges political literature at Conservative Party headquarters in London. Preparing for the February election, the three main parties are flooding the country with posters

Benelux in Slump

Benelux has unusually difficult problems to solve if she is to sell in the buyers' market. Her economy is geared to a standard of living above that in most competing nations. Her export prices are still above most competitors' because until the past few months she has been able to offer better delivery dates. Now price is the major consideration.

The union is in a slump. Nearly 282,000 are unemployed and 70,000 only partly employed in Belgium out of a population of about 8 million. The basic steel industry is still active, but machine tool makers, foundrymen and shipbuilders are hard hit. Foundries are operating at only 25 per cent of capacity.

Britain's Trade Gap Narrows

Devaluation is still winning industrial sales for Great Britain. Its trade gap with the U. S. is now at the lowest level in 18 months; its balances are more favorable with the rest of the world.

Coal sales, particularly, are high because of American labor difficulties. They could be even higher if production were up. Absenteeism is a major problem in the coal fields. The percentage rate for 1949 was

Europe Slates More Fairs for 1950

Feb. 3 to 7	Radio Components, Accessories and Radio-Electric Exhibition, Paris
Feb. 28 to Mar. 5	International Agricultural Machinery Exhibition, Paris
Mar. 5 to 12	International Trade Fair, Leipzig
Mar. 7 to 26	International Trade Fair, Copenhagen, Denmark
Mar. 12 to 20	International Agricultural Fair and Horse Show, Verona, Italy
Mar. 13 to 20	International Trade Fair, Vienna
Mar. 13 to 20	International Trade Fair, Prague
Mar. 16 to 26	International Automobile Salon, Geneva
Mar. 21 to 30	International Industries Fair, Utrecht, Netherlands (Spring Fair)
Mar. 29 to Apr. 2	German Industry Fair, Hannover. Light Industries and Consumer Goods Section
Apr. 12 to 30	International Trade Fair, Milan, Italy
Apr. 15 to 24	International Trade Fair, Lyon, France
Apr. 15 to 25	Swiss Industries Fair, Basel, Switzerland
Apr. 29 to May 14	International Industries Fair, Brussels
Apr. 29 to May 14	International Trade Fair, Poznan, Poland
Apr. 29 to May 14	International Trade Fair, Liege, Belgium
May 3 to 14	German Industry Fair, Hannover: Technical or Heavy Industry Section
May 8 to 19	British Industries Fair, London-Birmingham
May 13 to 29	International Trade Fair, Paris
May 21 to 29	International Trade Fair, Valencia, Spain
June 10 to 25	International Trade Fair, Barcelona, Spain
July 24 to 28	International Technical Exhibition of Radiology, Westminster, England
Sept. 16 to Oct. 1	International Electric Fair, Munich
Sept. 26 to Oct. 5	International Industries Fair, Utrecht (Fall Fair)

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12.46, almost one percentage point higher than in 1948 and nearly double the 1938 rate.

The Conservatives are already making good use of the fact in their campaign against nationalization that will be decided in the Feb. 23 general election.

Germans Study Trust Laws

A delegation from West Germany will soon land in the U. S. to study American methods to curb monopolies.

The steel industry still maintains that cartels and other agreements restricting competition are indispensable. They argue that in the case of steel the production ceiling of 11.1 million net tons annually forces a cartel-like system of allotting steel to the various consumers.

Business is booming in Western Germany, but one out of every ten employable persons is jobless. Unemployment doubled last year and now stands at the postwar high of 1,558,000.

Why? Because the nation's population is growing faster than its industries can recover from the war and because the nation lacks capital to finance industrial expansion. About 406,000 new job seekers entered the eastern zones in 1949, either as returning war prisoners or as fugitives from East Germany. One plan that may help the situation is a proposed government program to build 250,000 new dwelling units and provide 200,000 new jobs.

The business that is booming is the glitter type—restaurants, hotels and entertainment spots.

France Competes in India

The postwar competitive pattern is evolving in a new design, especially in areas like India which Britain once had sewed up.

France is competing there now and has just booked an order for 100,000 tons of steel for the Pakistan Railroad. French engineers have been requested to study and bid on development of the Chittagong harbor, construction of a subway at Calcutta and irrigation and power dams in the Damodar valley.

Norway Vetoes North Union

Norway doubts that a Scandinavian customs union will help economic recovery. Its veto of a proposed plan makes it doubtful that any northern union can be formed soon.

Norwegian war damage is almost completely repaired. Its industrial production is now 31 per cent above the 1938 level. The nation is reducing many price subsidies in its next budget.

Mill Pricing Effect

It's not so good in the steel barrel industry which has been hit by rising freight rates

MILL pricing has been in effect about 18 months in much of metalworking. How is it panning out?

In the steel barrel industry the answer is: "Just fair." Barrel makers have generally been operating on an f.o.b. basis since shortly after the Supreme Court's cement decision in 1948. Their problems are complicated because they make a bulky product that is unusually hard hit by rising freight rates. Manufacturers

NEA photo

A BULKY PRODUCT
. . . hard hit by freight rates

of smaller, lighter products are in a better position.

More Competition?—One government argument for delivered pricing is that it encourages competition. Does it? "Not in the steel barrel industry," says L. B. Keplinger, president of Steel Shipping Container Institute Inc. It has helped the multiple plant operator, but not the small manufacturer. A combination of mill pricing and high freight rates has compartmentized the industry so that a marketing area is limited to territory within about 200-300 miles of the average barrel-producing plant.

Here's why: Rail freight cost per barrel averages about 20 to 25 cents for a 300-mile haul, about 60 cents for a 550-mile haul. Now that the industry must sell mostly f.o.b., a 60-cent freight charge for a $4 barrel is usually out of the question.

Static Capacity—The result has been a greater tendency toward limited trade areas for each plant and a nearly static physical capacity for the industry. There are 70 plants in the U. S. that make metal barrels, drums and pails, the same number as in 1947. Twenty-four companies account for substantially all the production. Greatest plant concentration is in the Ohio-Chicago area; next densest region is the Eastern Seaboard.

In the first ten months of 1949, the industry produced 24,537,116 light and heavy steel barrels and drums, compared with 28,450,033 units for the same 1948 period. The 1950 output should at least equal the 1949 rate. The industry used 1,050,000 tons of steel in 1949 and will consume about the same this year. A slight lull in business now is caused by declining oil shipments abroad and inventory readjustments. Major users of barrels—the petroleum, chemical, food and paint industries—stocked up to an unusual extent last year just before the steel strike.

Alan Wood Starts New Mill

OPENING of Alan Wood Steel Co.'s new hot-rolled strip mill at Conshohocken, Pa., holds more than usual interest to metalworking companies in that area.

It not only provides them another source of steel but a short-haul source. The latter is particularly important now that consumers in most cases must pay the freight and that freight rates are increased.

This 30-inch mill and accompanying new plant, all of which cost the company $9 million, was dedicated Jan. 23 and put into commercial operation. Steel finishing capacity of the new plant is 218,000 tons annually and broadens the company's operations. Lack of finishing facilities has heretofore restricted the company to a large degree to sale of steel in semifinished form. When demand for semifinished was light a considerable portion of the company's capacity was kept idle.

The company, which has an open-hearth ingot producing capacity of 550,000 tons annually, sees the new hot-rolled strip mill as a stabilizer of its steelmaking operations. Demand for finished steel, the company points out, is normally more constant and greater than for semifinished. Alan Wood officials do not look upon the new mill as the company's final achievement. It, they say, is "the all-important and necessary bridge that will permit the exploitation of wider and more profitable markets."

Covering seven acres, the new plant was built in little over a year.

Steel Freight Rate to Orient Cut

PACIFIC Westbound Conference has reduced Transpacific rates on a number of steel items to meet increasing competition from Atlantic Coast and foreign—mostly Swedish and Belgian—shippers.

On iron and steel from Pacific Coast to the Orient, the base rate was reduced $5.50 a ton effective Jan. 12. The new tariff is $16.75 per long ton on bars, angles and sheets, $18.75 on nails, $19.75 on tin plate. Proposed cuts on billets, ingots and slabs to Formosa are being considered.

The new levels match recent cuts by the Atlantic Far East Conference. The $1.15 differential is retained.

Western Steel Shipments Up

SHIPMENTS of steel products from mills of western steel producers in the first three months of 1950 will increase approximately 24 per cent over the first quarter of 1949, according to estimates of the Pacific Coast Transportation Advisory Board.

The board calculates that 16,000 carloads of steel will move over the area's railroads during the quarter, compared with 14,881 carloads transported in the same three-month period last year.

In part, this large movement reflects deliveries on orders which piled up during the steel strike late last autumn, but it also mirrors prospects of continued high demand.

Budd Ships Rail Cars to Brazil

BUDD CO., Philadelphia, has completed shipment of 63 all-stainless steel streamlined railway cars to the Central Railroad of Brazil.

Included in the order were room-type sleepers, diners, coaches, baggage, mail, lounge-observation and business cars. The new streamliners will operate between Rio de Janeiro, Sao Paulo and Belo Horizonte, leading cities of Brazil.

Carrier Unveils 47 New Models

CARRIER Corp., Syracuse, N. Y., unveiled 47 new air conditioning and refrigeration products at a meeting of distributors and dealers.

New products include a wider size range of room air conditioners, an assortment of colors on these room conditioners to harmonize with interior decoration, a cooling tower that conserves 95 per cent of the water necessary for operation of the equipment, new food freezer models, additional refrigerator display cases and an ice cube maker.

To help push sales, Carrier in 1950 will expand its field organization 25 per cent. A new wholesale and retail financing plan is being inaugurated, and advertising and promotion budgets to back up the new products are being increased by 50 per cent.

STIMULUS AND REWARD: R. M. Raney, chief design engineer for Willard Storage Battery Co., Cleveland, gives Paul Wasie, student at Cleveland Institute of Art, a $250 check. Mr. Wasie was winner of a contest sponsored by Willard to stimulate interest in industrial design

CALENDAR OF MEETINGS

Jan. 30-Feb. 1, American Material Handling Society, Chicago Chapter: Midwest material handling conference, in conjunction with Illinois Institute of Technology, in Chicago.

Jan. 30-Feb. 1, National Crushed Stone Association and **Agricultural Limestone Institute:** Convention and Manufacturers Division Exposition, Stevens Hotel, Chicago. NCSA headquarters are at 1415 Elliott Pl., N.W., Washington.

Jan. 30-Feb. 3, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute headquarters are at 33 W. 39th St., New York.

Feb. 2-3, Electric Maintenance Engineers of Milwaukee: 11th annual industrial electrical equipment exposition, at the Public Service Bldg., Milwaukee.

Feb. 2-3, National Industrial Advertising Association and **Industrial Advertising Council of Pittsburgh:** Pittsburgh industrial advertising exposition, Hotel Roosevelt, Pittsburgh. General chairman of the event is Roy R. Mumma, 436 Seventh Ave., Pittsburgh.

Feb. 2-4, Society for the Advancement of Management, Chicago Chapter: Conference on cost reduction, at Chicago campus of Northwestern University. Chapter headquarters are at 53 W. Jackson Blvd., Chicago.

Feb. 3, Open-Hearth Committee, Eastern Section, AIME: Meeting in Philadelphia. This conference was originally scheduled for last Oct. 14, but was postponed because of the steel strike.

Feb. 7-9, Ohio Hardware Association: Exposition, Public Auditorium, Cleveland. Association headquarters are at 175 S. High St., Columbus, O.

Feb. 9-10, American Foundrymen's Society, Birmingham Chapter: Regional conference, Birmingham. Society headquarters are at 222 W. Adams St., Chicago.

Feb. 9-10, American Foundrymen's Society, Wisconsin Chapter: Regional conference, Schroeder Hotel, Milwaukee. Society headquarters are at 222 W. Adams St., Chicago.

Feb. 9-11, Society of Plastics Engineers: Meeting, Hotel Cleveland, Cleveland.

Feb. 12-16, American Institute of Mining & Metallurgical Engineers: General Meeting, Hotel Statler, New York. Institute headquarters are at 29 W. 39th St., New York.

Feb. 13-14, Society of the Plastics Industry (Canada): Canadian annual meeting, Royal York Hotel, Toronto, Ont. The Canadian segment of the society is associated with the American society whose headquarters are at 295 Madison Ave., New York.

Feb. 14-16, Purchasing Agents Association of Chicago: Products show, Hotel Sherman, Chicago. Association headquarters are at 134 N. La Salle St., Chicago.

Feb. 15-16, American Hot Dip Galvanizers Association Inc.: Annual meeting, Netherland Plaza Hotel, Cincinnati. Association headquarters are at 2311 First National Bank Bldg., Pittsburgh.

Feb. 15-17, American Chemical Society: Pittsburgh conference on analytical chemistry and applied spectroscopy, Hotel William Penn, Pittsburgh. Society headquarters are at 60 E. 42nd St., New York.

Feb. 20-21, American Material Handling Society, Indianapolis Chapter: Materials handling conference sponsored jointly with Purdue University, at Lafayette, Ind.

Feb. 24, Eastern States Blast Furnace and Coke Oven Association: Meeting, Hotel William Penn, Pittsburgh.

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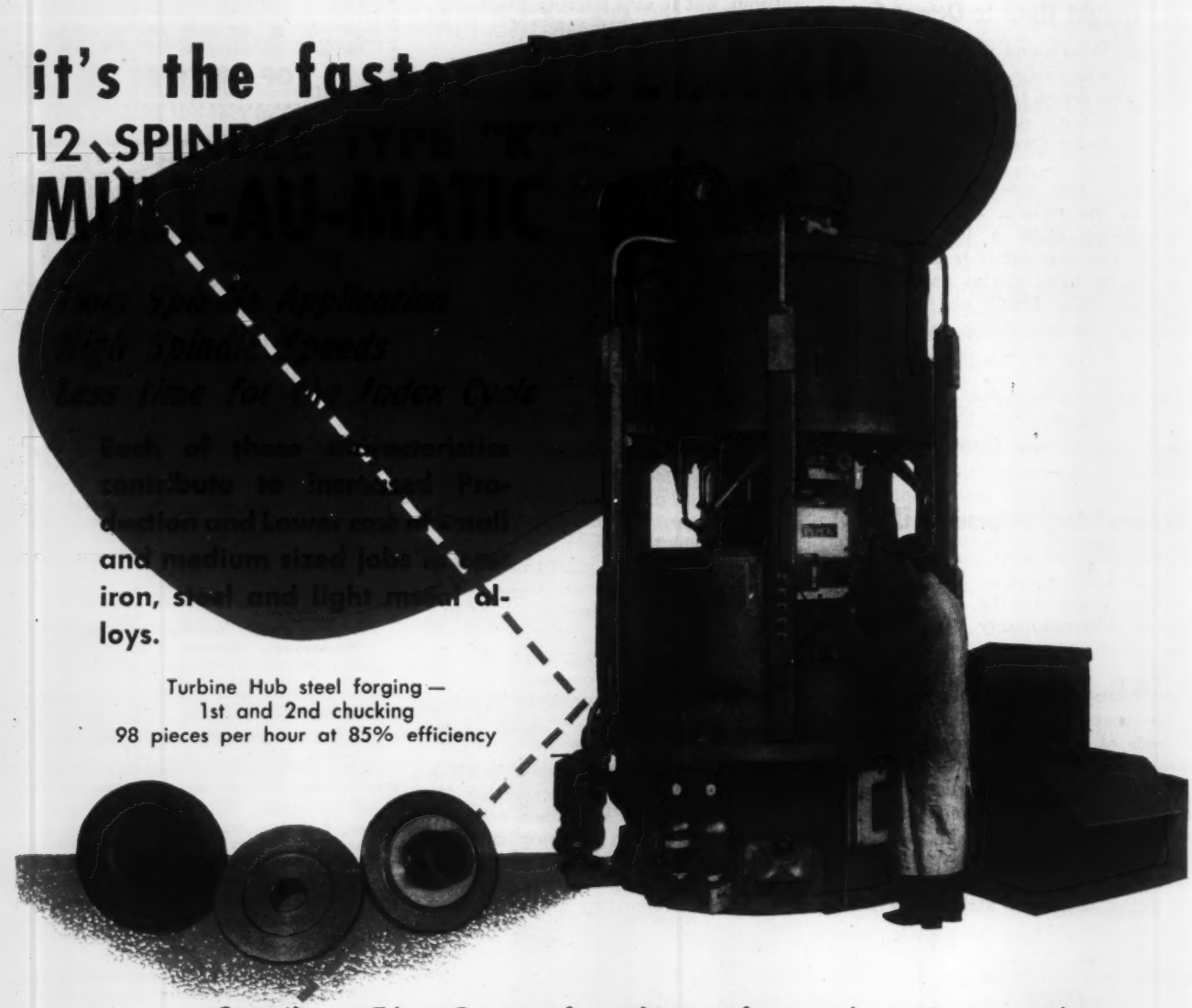
it's the fast[illegible]

12 SPIN[illegible]

MU[illegible]

[illegible] Spindle Speeds
[illegible] Spindle Speeds
Less time for the Index Cycle

Each of these characteristics contribute to Increased Production and Lower cost in small and medium sized jobs in [illegible] iron, steel and light metal alloys.



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1st and 2nd chucking
98 pieces per hour at 85% efficiency

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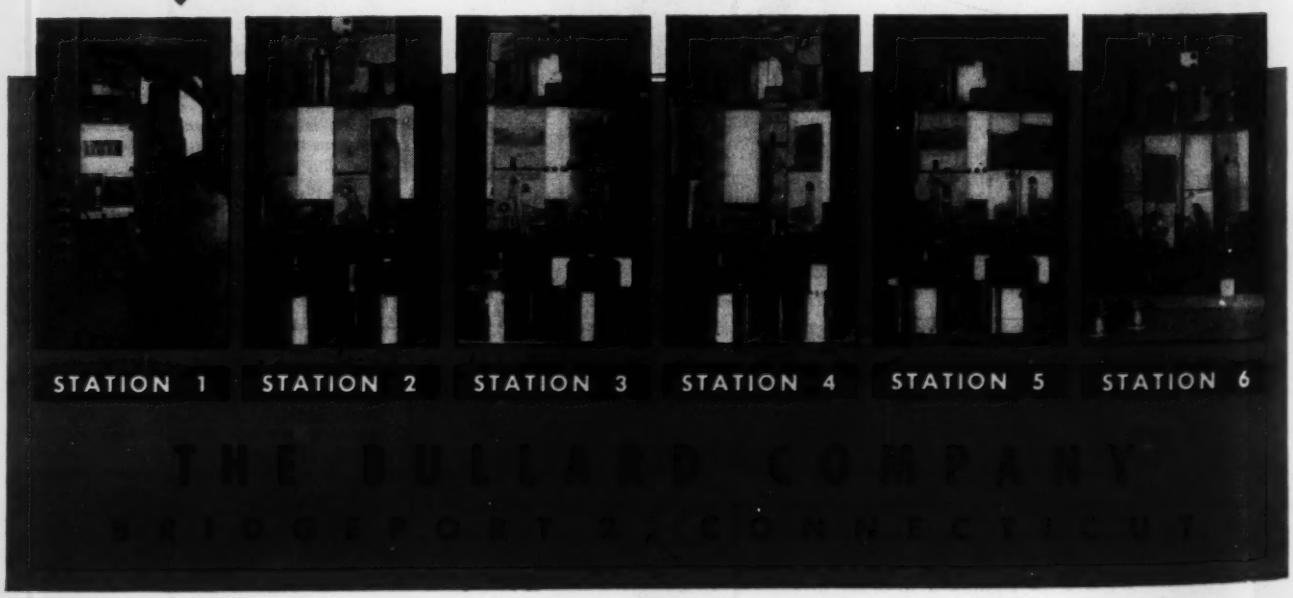
There are 19 operations combined in the 1st and 2nd chuckings. Each index of the machine delivers a finished piece. When writing for information refer to ad XK



By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

General Motors just one big scrappy family, with each division competing with others. Utility vs. beauty: All are looking for "a blonde who can cook"

DETROIT

SEARCHING study of the 23-page transcript of remarks made at the General Motors auto news writers' conference in New York Jan. 18 yields no nuggets of knowledge that have escaped general attention thus far. Rather the whole affair seems to point up the competitive differences between the various divisions of the corporation, at least from an engineering standpoint. Doubtless it was planned that way. GM in 1949 accounted for better than 42 per cent of the entire auto industry's production, thinks it might push this to 45 per cent this year. Now while the corporation has no reason to be overly concerned over Washington attacks on "big" business, at least it does no harm to further the impression that GM is just one big scrappy family, with each division jealous of what it has accomplished and inclined to minimize the achievements of the other.

Sticks to Overhead Valves—Thus, E. H. Kelley, Chevrolet's chief engineer, naturally thinks his overhead-valve engine is the best, considering efficiency in terms of cost. Further, he can be pardoned for boasting that Chevrolet had anticipated the trend to overhead-valve design years ago. When he says that tests have shown no necessity for getting away from the in-line six, that all depends upon the tests. Cadillac and Oldsmobile tests, with high-compression fuels, have shown that the V-8 is the best way to realize the structural rigidity and compactness demanded by tomorrow's engines.

George Delaney, Pontiac's chief engineer, naturally says the in-line L-head engine is plenty good enough and will not be changed "within the foreseeable future." Maybe his eyesight is not so good in press conferences. You talk to machinery people around Detroit and they will tell you that Pontiac is actively considering an overhead-valve V-8 for 1951, just as are Chrysler, Ford, Studebaker, Packard and maybe others.

Ed Cole, former chief engineer for Cadillac and now works manager, questioned as to why he does not give more consideration to fuel economy instead of horsepower, points to the 15-20 per cent gain effected in the 1950 engine—all through the route of high compression, mechanical efficiency and carburetion.

Can't Predict Too Far Ahead—Understandably, Charlie Chayne of Buick chimes in that 47 years of building valve-in-head in-line engines fail to convince him that any change is likely in the "immediate" future. But he added, "after all, in this business, you cannot predict very far ahead. Tommorow is as far as you dare go."

Jack Wolfram, chief engineer for Oldsmobile, says the outlook for a V-6 engine is cloudy. His division built some experimentally, found them compact but not necessarily or inherently low cost when compared with present in-line eights. There again, however, if compression ratios should move up to 10 or 12 to 1, the V-6 may be the answer to problems of structural rigidity.

When the discussion turned to transmissions, the boys lined up on both sides of the fence as could be expected—Buick and Chevrolet sticking with the torque converter, and Cadillac, Olds and Pontiac very satisfied with the step-type Hydra-Matic. On the latter side now can be enlisted Lincoln, Nash and Kaiser-Frazer, on the former Studebaker, Ford and Packard. Chrysler stands on the fence, looking both ways at once.

Wanted: Blonde Who Can Cook—In a question-and-answer period with C. E. Wilson, GM president, it was disclosed the corporation divisions consumed 4.1 million tons of steel last year. However, his socko statement for the occasion was in answer to a question of whether more attention was being directed toward the use of a car than toward its appearance. Said he: "I think I could say our objective is a blonde that can cook."

New Lincolns Introduced

THE 1950 Lincoln and Lincoln Cosmopolitan lines were front and center last week, boasting 150 mechanical improvements and styling changes, most of them not too readily noticeable. Refinements in the steering mechanism lessen steering effort by 15 per cent, straight-pull type handbrake is 50 per cent more efficient, oil economy is boosted by a new piston design, a three-point wedge belt drive to fan and water pump cuts slippage and improves pump performance, a five-blade fan runs more quietly at 16 per cent reduced speed, frames are heavier, door locks are improved, new colors and in-

1950 LINCOLN: The six-passenger coupe features more than 150 changes. Included are: a "centralized" instrument panel, "salon-styling" upholstery, numerous improvements in the 152 hp V-8 engine and Hydra-Matic transmission

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terior treatments are also offered.

Nash Boosts Records

TWENTY-FOUR page slick-paper annual report of Nash-Kelvinator Corp., one of the most elaborate this company has ever compiled, is in tune with the record-breaking fiscal 1949 production accomplishments—139,521 automobiles and 702,110 refrigerators and ranges. For the year ended Sept. 30, auto output was double the average for the five prewar years. Earnings exceeded $26.2 million, after taxes, equivalent to $6.04 per share, while long term debt was reduced $8 million. The N-K sales dollar broke down into 57c for materials and supplies, 22.3c for wages and salaries, 11.3c for taxes, 2.7c for wear and tear on plant, 1.6c for dividends, and 5.1c retained.

K-F To Broaden Line

HENRY J. KAISER and son Edgar F. talked enthusiastically last week of plans to broaden out their product line into the lower-priced field later this year, to add new body styles, including two-door sedans, to the point where there will be 21 in all, and to jazz up the styling of standard-size models so they will have a more popular appeal. The senior Kaiser left most of the talking to his son at the Willow Run press conference, but did attempt to sound out opinion of visiting writers on when the new small low-price Kaiser should be shown publicly. Decision: the Chicago Auto Dealers' Show Feb. 18. Anticipated date of first assemblies: June 30.

The Willow Run plant has been busy for the past three weeks cleaning up parts and disposing of stocks of finished cars. About 5000 resumed working there early this month and now face staggered layoffs until new Frazer models, little changed from their predecessors, go into production Mar. 17. After that the next series of standard Kaiser jobs, with new body styles, chassis, engines and suspension systems, will come along by the end of March, and finally the low-price design for which a name has not been selected from 400,000 suggestions in a recent prize contest.

Hydra-Matic Offered—Still to be distributed to the company's 3000 dealers (once there were 4400 and a further shrink to 2500 is expected), are about 4500 of the current models. The succeeding series of Kaisers and Frazers will have as optional equipment General Motors Hydra-Matic drive. Arrangements have been made to purchase the transmission from GM which will furnish technical assistance on installation and servicing. Prices on the senior K-F "1951" line will be no higher, perhaps a little lower, than current levels.

The unborn junior Kaiser accommodates five passengers, has 57-inch front seat, is low and racy, powered by either a four or six-cylinder Willys engine, compression ratios 7.35 to 1 and 7 to 1, respectively, and yielding gas economy of 35-40 miles per gallon. Body styling is suggestive of Studebaker at the front, while the rear fenders are finned in the Cadillac fashion. There is no rear deck lid, luggage being stowed behind the rear seat. Generally speaking, the two-door sedan is stripped-down pure transportation which could carry a price of around $1150.

Style Lines Good—Mark it down as for sure that the Kaisers are going to be in there punching for sales this year. It's either do or die and 1950 will tell the story. Stylewise the new lines look good, right up to snuff with the rest of the industry. Economy features of the new Kaiser should prove attractive, although there may be some sacrifice of power on the getaway. The Frazier definitely will not be orphaned, since over 100,000 already have been built. However, production schedules will accent the Kaiser strongly.

Tucker Acquitted

ACQUITTAL of Preston Tucker and seven associates of fraud and conspiracy charges in connection with their automobile manufacturing fiasco was followed by half an hour of pure corn in a Chicago federal courtroom as the defendants and their families screamed, wept, laughed and pounded each other on the back. After long weeks of testimony under direction of government lawyers, which must have cost taxpayers a pretty penny, the defense pulled a surprise move by resting its case and making no attempt to refute prosecution arguments. Tucker lawyers said the government had proved no offense, therefore they needed no defense. Apparently the jury was impressed.

Probably not so jubilant were the thousands who kicked in $28 million to the now-defunct Tucker enterprise in the form of stock subscriptions, dealer franchises and even elaborate accessory packages for cars that were never to be. They may yet have their innings, however, for it is said Mr. Tucker still faces civil suits totaling something like $30 million, even though his attorneys claim he is busted. All the recent verdict does is to acquit Mr. Tucker and his cohorts of any intent to perpetrate fraud or conspiracy.

The Tucker story is one of the strangest in automotive history. He himself is little more than a creature built up by the fertile imagination of public relations experts. Never a successful engineer or manufacturer, he still proved radioactive enough to draw about him, from time to time, dozens of experienced men from the automotive manufacturing field. Some stayed with him, others threw up their hands in disgust. One of the latter characterized Mr. Tucker as an impulsive boy who had no regard for the fact he was operating on other people's money.

To the end he drove up to court every day in a "Tucker" car and even managed to get himself into a television show with it in the process. Some said it was nothing more than an Oldsmobile chassis and engine, with a hand-hammered Tucker body bolted in place. He claimed his failure to get going on his multimillion dollar venture was caused by diabolical plotting against him by Detroit automotive interests, now says his first task will be to restore his wife's health and then he will be "open" to plans for reorganizing the Tucker Corp. There are several reorganization plans under consideration by those who are holding the remnants of the company, without Mr. Tucker.

Eventually the court wrangling will die down and the underwriters of the venture will lick their financial wounds into health. It is a good bet, however, that sooner or later the name of Preston Tucker will again be in the headlines with some new glittering project.

Auto, Truck Output

U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,966
June	623,689	454,401
July	604,351	489,736
August	678,092	478,186
September	657,078	437,181
October	601,021	516,814
November	474,731	495,488
December	392,000*	514,337
Total	6,541,323*	5,549,323

Weekly Estimates

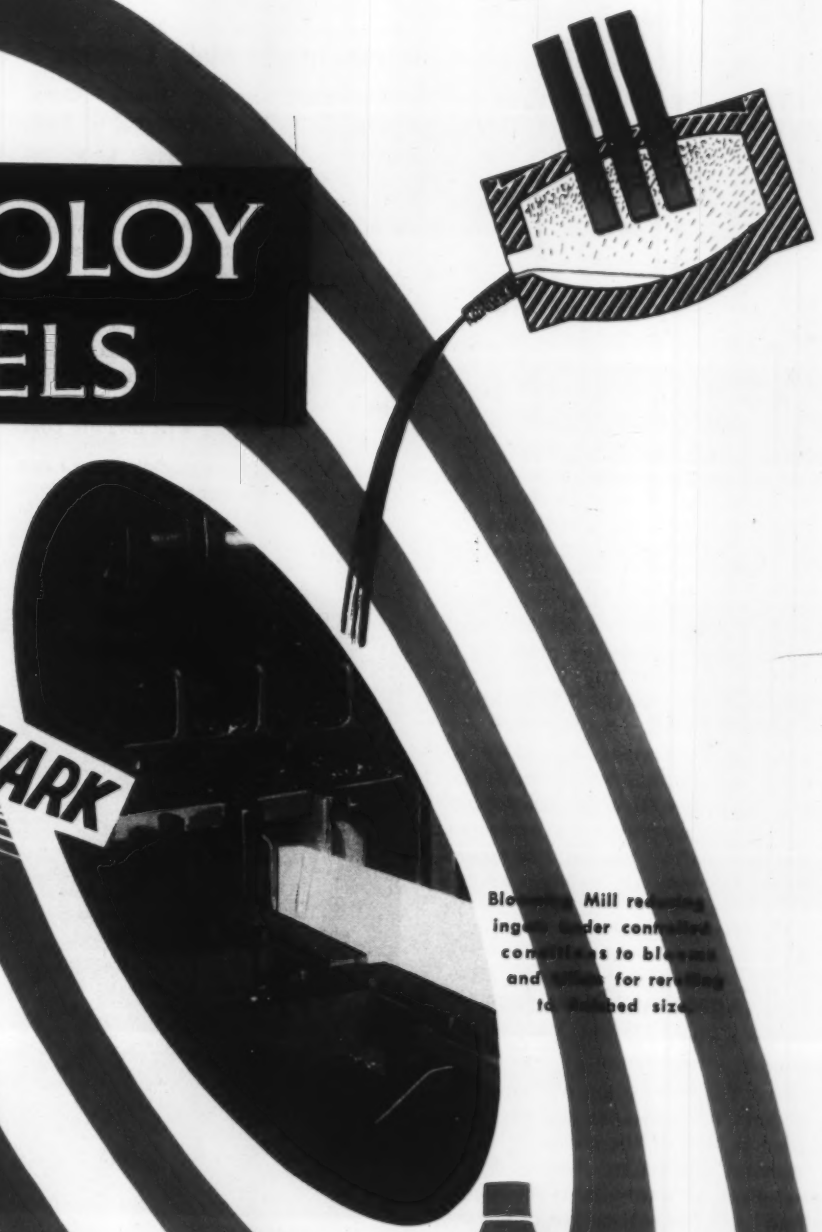
Week Ended	1950	1949
Jan. 7	116,768	98,422
Jan. 14	154,552	112,587
Jan. 21	157,950	113,820
Jan. 28	137,000	116,471

Estimates by Ward's Automotive Reports

* Preliminary.

ARISTOLOY STEELS

HIT THE MARK



Blooming Mill reducing ingots under controlled conditions to blooms and billets for rerolling to finished size.

ARISTOLOY STEELS

STANDARD STRUCTURAL ALLOY
BEARING QUALITY • ALLOY TOOL
SPECIALTY • NITRALLOY
CARBON TOOL • STAINLESS
MAGNAFLUX— AIRCRAFT QUALITY

COPPERWELD STEEL COMPANY, WARREN, OHIO

117 Liberty Street
New York, New York

176 W. Adams Street
Chicago, Illinois

P. O. Box 1633
Tulsa, Oklahoma

1578 Union Commerce Building
Cleveland, Ohio

7251 General Motors Building
Detroit, Michigan

403 W. Eighth Street
Los Angeles 14, California

529 Fisher Building
Detroit, Michigan

3104 Smith Tower
Seattle, Washington

Monadnock Building
San Francisco 5, Calif.

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Lewis Buys Joy Plant

It will be organized as separate entity—Breckenridge Machine Division

PURCHASE of the Euclid, O., plant and equipment of Joy Mfg. Co., Pittsburgh, by Lewis Welding & Engineering Corp., Bedford, O., was announced by J. T. Lewis Jr., president of Lewis Welding.

He says the new plant will be organized as a separate manufacturing entity. It will do machine work and machine assembly work as the Breckenridge Machine Division of Lewis Welding & Engineering Corp. Hiring of shop personnel will be started Feb. 1. About 150 employees will be added to the payroll.

Mr. Lewis says the purchase of the plant was a result of Joy's program of rearranging, consolidating and improving its manufacturing operations. Lewis Welding will continue to handle Joy manufacturing work at the Breckenridge plant on a contract basis until Joy is prepared to absorb such work in its other six factories.

"Built and equipped originally to manufacture machine tools," says Mr. Lewis, "our new Breckenridge Division will place particular emphasis on construction of special machinery for metalworking in addition to the usual general work that was always a part of the business."

G & L Expanding Operations

A NEW STORAGE building is under construction for Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. It is part of the expansion and consolidation plan of the company which is moving Cincinnati Planer Co. to Fond du Lac where it is being absorbed by the parent company (STEEL, Jan. 16, p. 28).

Large machine operations of Cincinnati Planer will be carried on in a building that was purchased by G & L from the government in 1949. Other operations will be absorbed in the company's present facilities.

The new storage building and other buildings now being used by G & L will provide about 208,000 sq ft of floor space for manufacturing purposes. When the move has been completed all buildings used by G & L during the war will again be utilized.

The trade name of the Cincinnati line will be continued. Products will be sold under the name of the Cincinnati Planer Co. Division of Giddings & Lewis Machine Tool Co.

Consolidation of the two companies means new jobs for about 100 more persons in Fond du Lac. R. J. Kraut, president and general manager, says former employees will be given preference in filling the new job openings.

Razor Firm To Make Cameras

AMERICAN Safety Razor Corp., Brooklyn, N. Y., is planning to make cameras.

The firm has already made a pilot model and expects to market cameras in a test area by May 1. Full production and nationwide sales are planned for late fall.

The unit will retail for about $10. It will use film sealed into a disc-like magazine good for eight exposures. The size of the pictures will be about 3 by 4 inches. The magazine will sell for about $1, which will include costs of developing and printing. The whole magazine will be returned to stores for processing.

American Safety Razor will buy lenses and film from other manufacturers, but will make the rest of the camera. The company spent about $350,000 developing the product.

Wright Hoist Sold

OHIO Electric Mfg. Co., Cleveland, bought all assets except the plant of Wright Hoist Division of Lisbon Hoist & Crane Co., Lisbon, O.

The Bob-Cat hoist will be manufactured in the Ohio Electric plant in Cleveland. Full production is scheduled for early April. Distribution wil be through Ohio's own sales force and mill supply houses.

World-Wide Market Envisioned for Speed Nuts

TINNERMAN Speed Nut fasteners soon will be available all over the world. This is the plan being drawn by Tinnerman Products Inc., Cleveland, Simmonds Aerocessories Ltd., its British licensee, and Dominion Fasteners Ltd. of Canada.

Simmonds will build a new plant in Australia near Melbourne. It also will triple or quadruple output in Great Britain where 4 million fasteners are being made weekly.

To get more American know-how, Simmonds sent its chief engineer, W. J. Burnell, left, and its technical director, L. G. Oxford, right, to Cleveland to talk over engineering, production and sales problems with George A. Tinnerman, center, vice president and general manager of Tinnerman Products, and other company officials.

The Australian plant will cover about 75,000 sq ft and will be patterned after Tinnerman's new Cleveland plant, although on a much smaller scale.

The output of the British plant in Wales will be upped by increasing floor space.

Under the world-wide marketing plan, Tinnerman will concentrate on the United States, Dominion will cover Canada and South America and Simmonds will supply the remainder of the world.

Briefs . . . .

"Build With Steel" is the title of a 25-minute 16 mm motion picture in color, produced for and distributed by **American Institute of Steel Construction,** New York.

—o—

Mine Safety Appliances Co., Pittsburgh, established an International Division to co-ordinate activities of its subsidiaries in Canada, South Africa and Great Britain. It will continue activities of the company's present export department. C. M. Donahue will be manager of the new division.

—o—

Rivett Lathe & Grinder Inc., Boston, purchased the entire line of Gerotor air and hydraulic valves, cylinders and hydraulic power units from Gerotor May Corp., Baltimore. Manufacturing and selling operations are being transferred to Boston.

—o—

The Indiana State Department approved an amendment to articles of incorporation of **United Engineering & Foundry Co.'s** Aurora, Ind., subsidiary whereby the name of the corporation becomes Stedman Foundry & Machine Co. Inc. instead of Stedman's Foundry & Machine Works Inc.

—o—

Automatic Firing Corp. moved its general offices to its new home, 4417 Oleatha Ave., St. Louis 16. Within a few weeks the company will move its factory equipment also.

—o—

Anstice Co. Inc., Rochester, N. Y., expanded its facilities to include die castings and permanent mold castings. Expansion included purchase of a good deal of automatic machinery.

—o—

Operations carried on by Georgia Lead Works of Cincinnati branch of National Lead Co. will be conducted under the name **National Lead Co.,** Atlanta Branch, effective Feb. 1. George W. Pendery was appointed manager of metal and pigment sales of the new branch.

—o—

Blaw-Knox Co., Pittsburgh, formed a chemicals and fuels synthesis department. The new activity will deal with conversion of fuels into chemicals and will be based initially on the Fischer-Tropsch synthetic fuels process and on related processes for making synthesis gas. The department will be staffed by engineers from the company's Chemical Plants Division.

—o—

Dow Chemical Co., Midland, Mich., appointed **Reliance Steel Co.,** Los Angeles, to handle warehouse magnesium products. The move is Dow's first venture into warehousing of magnesium; it is expected to be a nationwide service eventually. At first Reliance will warehouse a limited supply of extruded rods, bars and shapes; other wrought products will be added later.

—o—

District sales office of **Braeburn Alloy Steel Corp.,** Buffalo, was moved to the Prudential building. Company is considering establishment of a Buffalo warehouse.

—o—

Allis-Chalmers general machinery division named Hild Electric & Mfg. Co., Stockton, Calif., and Northwest Chain & Sprockets Inc., Portland, Oreg., as Pacific Coast dealers.

—o—

Three subsidiary firms of **Line Material Co.,** Milwaukee, became divisions of **McGraw Electric Co.,** Elgin, Ill. The action was part of the merger last year through an exchange of stock of Line Material with McGraw. Firms that will be divisions of McGraw are Material Sales Corp. of New York, Oneida, N. Y.; Line Material Co. of Pennsylvania, East Stroudsburg, Pa.; and Southern Line Material Co., Birmingham. These companies make airport and street lights, electrical distribution specialties and pole line hardware items.

—o—

J. W. Speaker Corp., Milwaukee, bought the line of rear view mirrors, directional signals and adapter units from **Ajax Mfg. Co.,** Detroit. Included in the sale are manufacturing rights and patents. The Ajax line known as Amacor will be called Speaker-Amacor, an adjunct of Speaker's line of automobile equipment.

—o—

Baker Mfg. Co., Evansville, Wis.—farm water pumping equipment—is erecting a new single-story branch office and warehouse in Omaha, Nebr.

—o—

Affiliated Gas Equipment Co., Cleveland, contracted to buy under certain conditions the F. L. Jacobs Co. plant in Indianapolis. The Jacobs plant was built for manufacture of Launderall washing machines and Coca-Cola vending units. Affiliated's president, Lyle C. Harvey, says the Indianapolis plant will be used largely by the Bryant Heater Division for making water heaters and other Bryant products.

—o—

William H. Howland, purchaser of the **Janesville Metal Spinning** business from Owen W. Perkins, Janesville, Wis., has moved the machinery to his **Junction Heating & Sheet Metal Co.** building in Milton Junction, Wis. The name of the business is now **Wisconsin Metal Spinning Co.**

AT HIS FINGERTIPS: Milling time is saved and guesswork eliminated by three Westinghouse tachometers showing feeds and speeds on this Model 570 Giddings & Lewis horizontal boring mill at the Sunnyvale, Calif., plant of Westinghouse Electric Corp. The operator can determine rpm of the cutter shaft, rate of feed and speed of the saddle by the dials above the controls

Socony-Vacuum Oil Co. Inc., New York, will build three more Thermafor catalytic cracking units at refineries in Buffalo, Beaumont, Tex., and Brooklyn, N. Y. The three units are in addition to four other units announced several months ago. The TCC units with moving-bed catalysts will replace existing fixed-bed units in every case.

—o—

American Brake Shoe Co., New York, opened a new sales office in Houston to provide more direct service to its customers in the Southwest. William C. George will represent Brake Shoe's American Manganese Steel, Electro-Alloys and National Bearing divisions in the new office. His activities will supplement the company's present coverage in the railroad equipment field and will center in Oklahoma, Texas and Louisiana.

—o—

Thirteen Chicago officials of **International Harvester Co.** flew to Havana for the company's first large foreign conference since the war. A number of its products—International trucks, International Harvester refrigerators and industrial power equipment—will be introduced to sales representatives of Latin American republics.

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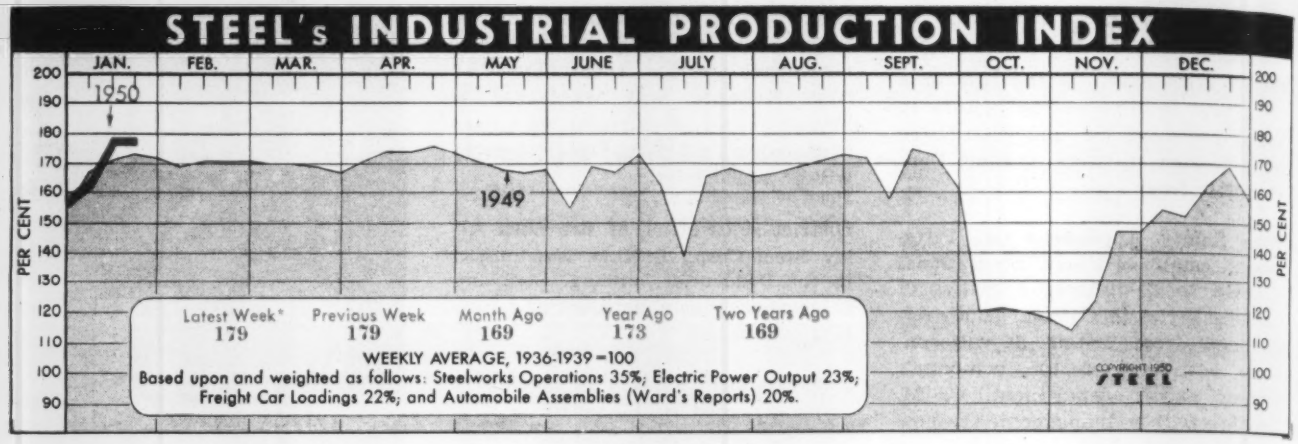
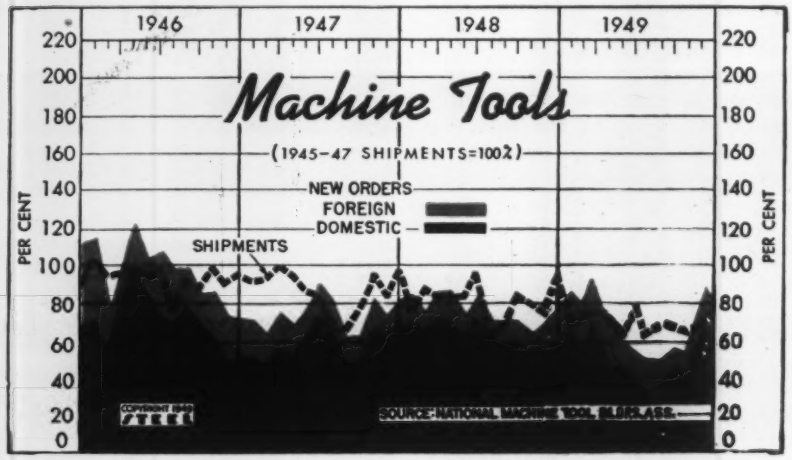

STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1950
1949
PER CENT
Latest Week* 179
Previous Week 179
Month Ago 169
Year Ago 173
Two Years Ago 169
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1950 STEEL

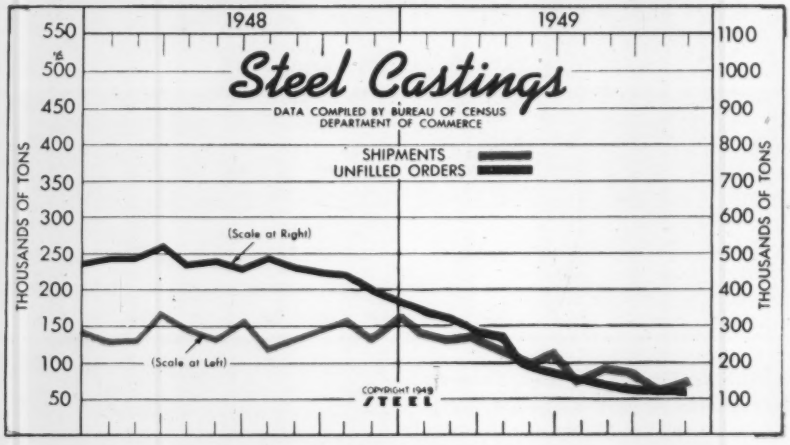
* Week ended Jan. 21 (preliminary).



Machine Tool Indexes

(1945-1947 Shipments = 100)

	Orders—Total		Orders—Domestic		Shipments	
	1949	1948	1949	1948	1949	1948
Jan.	87.0	83.1	65.1	69.1	68.8	75.3
Feb.	80.9	77.3	54.4	64.6	70.3	87.1
Mar.	93.5	86.3	71.2	70.2	75.8	83.6
Apr.	70.1	86.3	47.0	72.2	74.7	82.0
May	63.7	73.5	47.9	62.1	72.8	82.6
June	53.6	83.4	38.0	71.5	79.0	94.4
July	48.0	74.0	34.0	61.1	60.7	62.4
Aug.	51.5	73.7	32.7	60.9	67.3	69.8
Sept.	57.7	73.1	44.0	61.5	67.6	84.7
Oct.	56.8	67.4	43.1	53.4	62.3	80.4
Nov.	84.3	72.2	67.3	54.1	67.6	76.2
Dec.	82.5	76.7	60.1	60.5	75.7	96.9

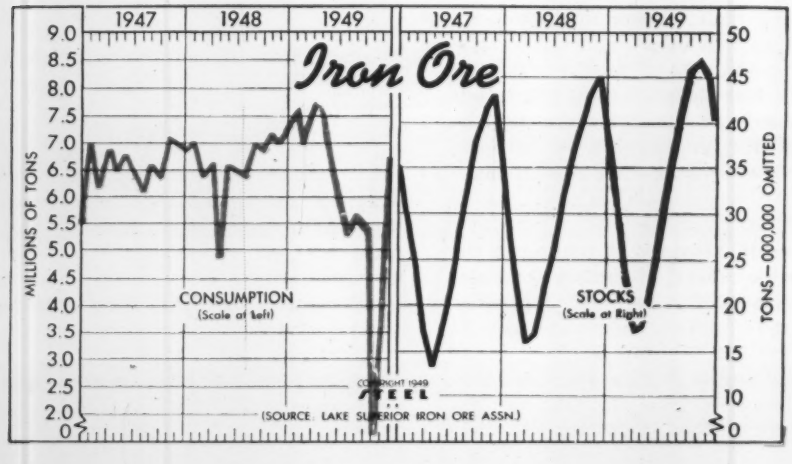


Steel Castings

(Net tons in thousands)

	Shipments			Unfilled Orders*		
	1949	1948	1947	1949	1948	1947
Jan.	140.6	141.1	139.0	338.9	491.7	365.5
Feb.	135.0	142.4	125.6	320.2	497.1	421.4
Mar.	138.9	162.9	134.9	284.8	508.8	434.9
Apr.	120.0	150.3	144.2	250.5	472.4	427.6
May	106.2	143.3	140.9	191.5	482.5	443.2
June	116.1	152.9	139.0	173.2	470.0	445.5
July	78.7	120.4	117.0	155.5	497.4	473.9
Aug.	90.0	140.2	120.4	143.6	472.5	478.6
Sept.	86.5	149.2	137.4	127.7	448.0	526.2
Oct.	70.7	153.0	148.4	124.8	424.5	497.3
Nov.	76.4	146.8	130.1	117.9	395.0	493.3
Dec.	....	157.4	148.1	....	354.5	489.4

* Castings for sale.



Iron Ore

(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1949	1948	1949	1948
Jan.	7,590	7,057	31,904	29,081
Feb.	6,992	6,440	24,981	22,628
Mar.	7,735	6,634	17,308	16,022
Apr.	7,322	4,976	17,803	17,125
May	7,277	6,656	21,508	22,058
June	6,249	6,577	27,696	26,965
July	5,258	6,479	35,064	32,611
Aug.	5,711	7,036	40,811	37,081
Sept.	5,541	6,965	45,356	40,923
Oct.	877	7,273	47,017	43,883
Nov.	3,520	7,058	44,786	45,160
Dec.	6,760	7,351	38,629	39,480
Total	70,833	80,504		

The Business Trend

SECOND consecutive week of production equaling the alltime weekly high was recorded in the week ended Jan. 21. STEEL's industrial production index was unchanged at 179 per cent (preliminary) of the 1936—1939 average. Except for a cloudy labor picture the present situation is healthy and vigorous.

Estimates by the Federal Reserve Board are that its industrial production index for December will rise to about 176 and the January figure should be about 2 points higher. The Chrysler strike and cutbacks because of coal shortages may wipe out the expected January gain.

STEEL—Output of steel for ingots and castings was at 92 per cent of rated capacity in the week ended Jan. 21, a 2 point drop from the preceding week. The decline was caused by a local railroad strike in the Buffalo district which crippled steelmaking in the area's largest mill. Although demand continues high, steelmaking rate will fall as mills reduce operations because of shrinking coal supplies.

COAL—In the first two weeks of 1950 more than 10 million tons of bituminous coal were lost because of the three day work-week and growing total stoppages. In the week ended Jan. 14, for example, 7,425,000 tons were mined, compared with 11,775,000 in the like week a year ago. Even electric light and power companies who had mountainous coal stockpiles at the end of the summer are faced with curtailing service to industrial accounts.

AUTOMOBILES—Unless an early settlement of the Chrysler strike clears the air, the automotive industry's plans for a record first quarter will not be realized. Automakers' schedules called for about 1,990,000 vehicles in the first quarter. In the week ended Jan. 21 U. S. plants produced 150,345 vehicles and Canadian plants added 7605.

POWER—Electric energy distributed continues its climb to new highs. Edison Electric Institute reports the total for the week ended Jan. 21 set an alltime high for the second consecutive week as it reached 6,041,158,000 kwhr. Curtailments forced upon the electric power utilities by a fuel shortage may put a halt to further increases in electric energy distributed.

MACHINE TOOLS—New orders index of National Machine Tool Builders' Association dipped 2 points in December to 82.5 per cent of 1945—1947 average monthly shipments. Shipments rose to an index figure of 75.7. Decline in new orders was contrary to preliminary estimates.

PETROLEUM—Bureau of Mines forecasts total demand for all oils in the first quarter at about 6.5 million barrels daily, up 4.5 per cent over the like 1949 period. Exports will drop sharply and imports will be about the same as a year ago.

BUSINESS—Business failures declined to 770 in December from 835 in November, says Dun & Bradstreet, but were higher than the 531 recorded in December, 1948. Liabilities dropped moderately to $19.3 million in the latest month from nearly $23 million in November. Liabilities in 1949 totaled $308,190,000.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	92.0	94.0	94.5	100.0
	Electric Power Distributed (million kilowatt hours)	6,041	6,029	5,994	5,769
	Bituminous Coal Production (daily av.—1000 tons)	1,237	938	1,452	1,963
	Petroleum Production (daily av.—1000 bbl)	4,962	4,925	4,995	5,473
	Construction Volume (ENR—Unit $1,000,000)	$182.2	$193.5	$155.5	$96.6
	Automobile and Truck Output (Ward's—number units)	157,950	154,552	72,994	113,302
	* Dates on request. †1950 weekly capacity is 1,906,267 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	607†	631	623	710
	Business Failures (Dun & Bradstreet, number)	231	207	196	142
	Money in Circulation (in millions of dollars)‡	$27,121	$27,311	$27,833	$27,717
	Department Store Sales (changes from like wk. a yr. ago)‡	−5%	−25%	+2%	+5%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$14,415	$13,907	$17,254	$13,731
	Federal Gross Debt (billions)	$257.0	$256.9	$256.9	$252.3
	Bond Volume, NYSE (millions)	$23.6	$37.0	$21.1	$19.5
	Stocks Sales, NYSE (thousands of shares)	7,980	14,799	7,115	4,107
	Loans and Investments (billions)†	$67.4	$67.2	$67.6	$62.6
	United States Gov't. Obligations Held (millions)†	$37,920	$37,514	$37,409	$33,324
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.13	156.13	156.83	155.05
	STEEL's Nonferrous Metal Composite‡	160.5	161.2	161.5	232.6
	All Commodities†	150.9	151.4	151.1	160.3
	Metals and Metal Products†	169.4	169.5	169.6	175.6
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

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Men of Industry

JAMES P. STEWART

MARSHALL H. JONES

LEON F. MILLER

James P. Stewart, vice president and manager of commercial sales division, **De Laval Steam Turbine Co.,** East Trenton, N. J., has been elected executive vice president. He will continue as manager, commercial sales division. Mr. Stewart joined the company in 1946 to handle sales of centrifugal compressors after 17 years' capital goods experience with Elliott Co., Jeannette, Pa., and Borg-Warner Corp., Milwaukee, where he had engineering, production, sales and executive positions. **W. A. Reynolds,** manager of IMO-De Laval Products Division, has been appointed assistant to the president, and **W. A. Neumann Jr.,** controller, has been appointed acting manager of that division, retaining the title of controller.

—o—

George L. Stewart, vice president, Columbia Steel & Shafting Co., Carnegie, Pa., in charge of Edgar T. Ward's Sons Co., has resigned to take up new duties with **W. J. Holliday & Co.,** Hammond, Ind. He has been with Columbia Steel & Shafting for 26 years and vice president since 1938.

—o—

Milton F. Beecher has been elected vice president in charge of research and development by **Norton Co.,** Worcester, Mass. **George N. Jeppson** was re-elected as board chairman and **Milton P. Higgins** as company president. **Ralph F. Gow,** executive vice president of Norton Co., was elected vice president of Norton Pike Co., and **Ralph M. Johnson,** vice president in charge of sales, Norton Co., was named to the Norton Pike Co. board. Mr. Beecher, who was appointed research engineer in 1919, became director of research at Norton in 1941.

Marshall H. Jones has been elected president, **Globe Iron Co.,** Jackson, O., succeeding his brother, **Edwin A. Jones,** who was named chairman of the board of directors. **James W. Morgan** was named vice president, and **Winston Pfancuff** was elected assistant secretary. **Charles P. Chapman** continues as secretary and treasurer of the company. Marshall H. Jones joined Globe in 1932 and served continuously with the company except for two years when he was in the U. S. Navy. On returning to the company he was named vice president and general manager.

—o—

Wayne D. Staley, formerly New York district manager, **Duriron Co.,** has been appointed general sales manager, located at the home office, Dayton, O. In directing sales and advertising activities he succeeds **D. E. Jack,** who has resigned as vice president in charge of engineering and sales. **F. R. Sharpe,** manager of the Philadelphia office, has been appointed New York district manager, and is succeeded at Philadelphia by **Ralph L. Watts,** formerly sales engineer in New York.

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Martin W. Valuck has been appointed purchasing agent, **Sealed Power Corp.,** Muskegon, Mich., succeeding **Roy S. Harvey,** retired.

—o—

Gloster P. Hevenor has been elected executive vice president of **Aquadyne Corp.,** New York. He will direct the company's expanding activity in the field of dust control in industry. For 18 years prior to joining Aquadyne Corp. Mr. Hevenor was with Johnson-March Corp., and was president from 1943 to 1948.

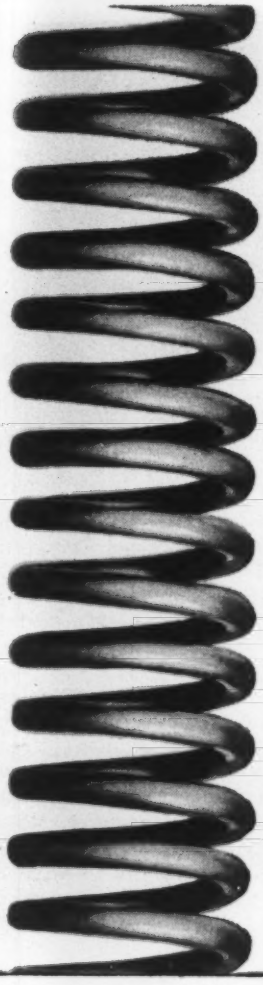
Leon F. Miller has been elected vice president in charge of sales and engineering, foundry machinery division, **Osborn Mfg. Co.,** Cleveland. He joined the company in 1929, and for the last six years has been sales manager. Mr. Miller is a member and past director of the Cleveland Chapter, American Foundrymen's Society.

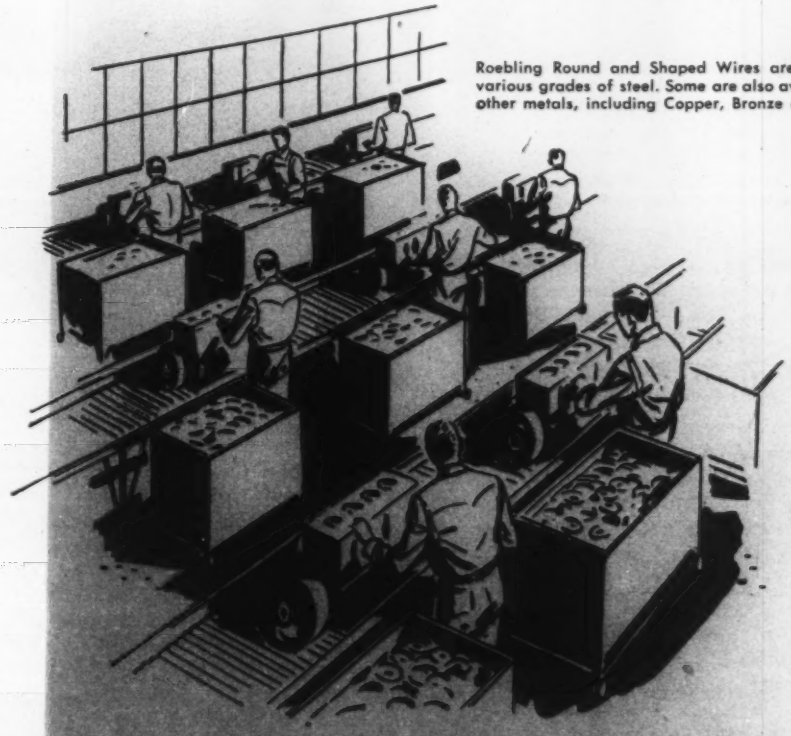
—o—

Baird Associates Inc., Cambridge, Mass., announces the following organizational changes: **Dr. Walter S. Baird** is president and general manager; **John Sterner,** vice president in charge of sales; **Francis Chamberlain,** former head of the instrument service department, is treasurer; and **Donald E. Williamson,** chief engineer, is now director of engineering and instrument service.

—o—

Following reorganization of **Flint & Walling Mfg. Co. Inc.,** Kendallville, Ind., brought about through sale of stock held by eastern interests and subsequent resignation of **H. T. Park,** president, and **W. H. Macomber,** secretary-treasurer, the following officers have been elected: **Cecil R. Welch,** president. **Benjamin F. Van Hart,** vice president, and **Henry L. Ortstadt,** secretary-treasurer. Mr. Welch is president, Fort Wayne Securities Co., stock and bond broker of Ft. Wayne, Ind. Mr. Van Hart, formerly of Kendallville, was for many years in business for himself as a distributor for Globe Slicing Machine Co. in Detroit and San Diego, Calif. Mr. Ortstadt is vice president of Kendallville Foundry. In addition to the above named officers the board of directors includes **Richard C. Cole, Ferris Shaffer** and **R. C. Ratto.** Both Mr. Park and Mr. Macomber had been

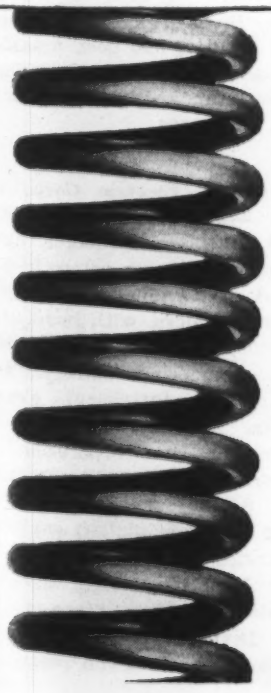




Roebling Round and Shaped Wires are made in various grades of steel. Some are also available in other metals, including Copper, Bronze and Brass.

Every inch dependably uniform... that's why users say...

Today it's Roebling!



for Oil-Tempered Spring Wire

NO IFS, ANDS OR BUTS . . . production records show that Roebling Oil-Tempered Spring Wire cuts down machine stoppages and minimizes rejects for users everywhere. This is a *quality* wire. Every inch is alike in gauge and finish . . . absolutely uniform in mechanical and metallurgical properties.

Roebling has one of the largest mills in the country for the making of specialty wires. From steel-making to finished wire, every manufacturing step is performed in Roebling's own plants. Modern techniques and modern precision equipment assure a product that saves you preparation time . . . brings faster, smoother operation.

Your Roebling Field Man will gladly help you choose the best wire—round, flat or shaped—for greatest efficiency and economy. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING *A CENTURY OF CONFIDENCE*

Atlanta, 934 Avon Ave. ★ ***Boston,*** 51 Sleeper St. ★ ***Chicago,*** 5525 W. Roosevelt Road ★ ***Cincinnati,*** 3253 Fredonia Ave. ★ ***Cleveland,*** 701 St. Clair Ave., N. E. ★ ***Denver,*** 4801 Jackson St. ★ ***Houston,*** 6216 Navigation Blvd. ***Los Angeles,*** 216 S. Alameda St. ★ ***New York,*** 19 Rector St. ★ ***Philadelphia,*** 12 S. Twelfth St. ★ ***Portland,*** 1932 N. W. 14th Ave. ★ ***San Francisco,*** 1740 Seventeenth St. ★ ***Seattle,*** 900 First Ave. S.

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with the company for 25 years and active in its management since 1940.

—o—

Merle J. Graham has been appointed manager of production, **Allegheny Ludlum Steel Corp.**, Pittsburgh, and **Frank G. Benford,** assistant manager, West Leechburg, Pa., plant, was named to succeed Mr. Graham as plant manager.

—o—

William J. Murray has been appointed manager of the fence department of **Copperweld Steel Co.,** Glassport, Pa. He will head up sales and installations of chain link fence, barbed wire and other Copperweld fence products.

—o—

E. J. Thompson has been appointed branch manager, **Claud S. Gordon Co.,** Cincinnati office. Before joining the company he was engaged in his own business as consulting metallurgical engineer.

—o—

Dow Chemical Co., Midland, Mich., announces that **T. H. Caldwell Jr.,** former manager of die casting sales, magnesium division, will join its chemical sales staff at the new Atlanta sales office.

—o—

Robert C. Johnston has joined the sales force of **Hickman, Williams & Co.,** Chicago. For the last year he has been with the blast furnace department of the Gary steelworks, Carnegie-Illinois Steel Corp.

—o—

Webb Wilson has been named vice president and treasurer of **Kaiser-Frazer Corp.,** Willow Run, Mich. A director of Fairchild Engine & Airplane Corp. from 1939-1949, he also served that company as a member of its executive committee from 1939 to 1942, and as treasurer from 1942 to July of last year. In his new position Mr. Wilson will be a member of the K-F finance committee.

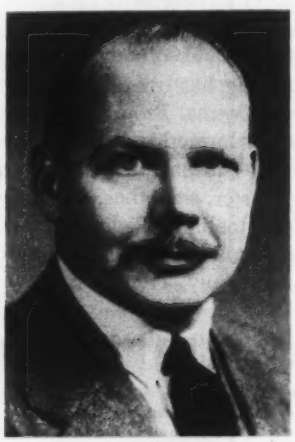
WEBB WILSON

HARRY W. DAVIDSON

Harry W. Davidson has been elected secretary-treasurer, **Heppenstall Co.,** Pittsburgh. He joined the company in 1943 and worked at the Heppenstall-Eddystone Corp., Eddystone, Pa., until that Navy-owned plant closed in 1944. Transferring to Pittsburgh, Mr. Davidson served Heppenstall Co. in various capacities during the last five years. New members of the Heppenstall board of directors include: Mr. Davidson; **Robert C. Downie,** president, Peoples First National Bank & Trust Co., Pittsburgh, and chief, Pittsburgh Ordnance District; and **E. P. Hawkins,** Callaway Mills Inc., New York. **S. B. Heppenstall Sr.,** chairman of the board of directors of Heppenstall Co., has retired and the board chairmanship will remain vacant for the immediate future.

—o—

Chase Brass & Copper Co., Waterbury, Conn., announces that **Kemp G. Fuller** has been retained as marketing consultant. He recently resigned from Chase Brass, where he was manager of marketing, to establish his own business in Pittsburgh, specializing in the co-operative development of programs for strengthening sales performances.



KEMP G. FULLER

FRED M. SHELLEY JR.

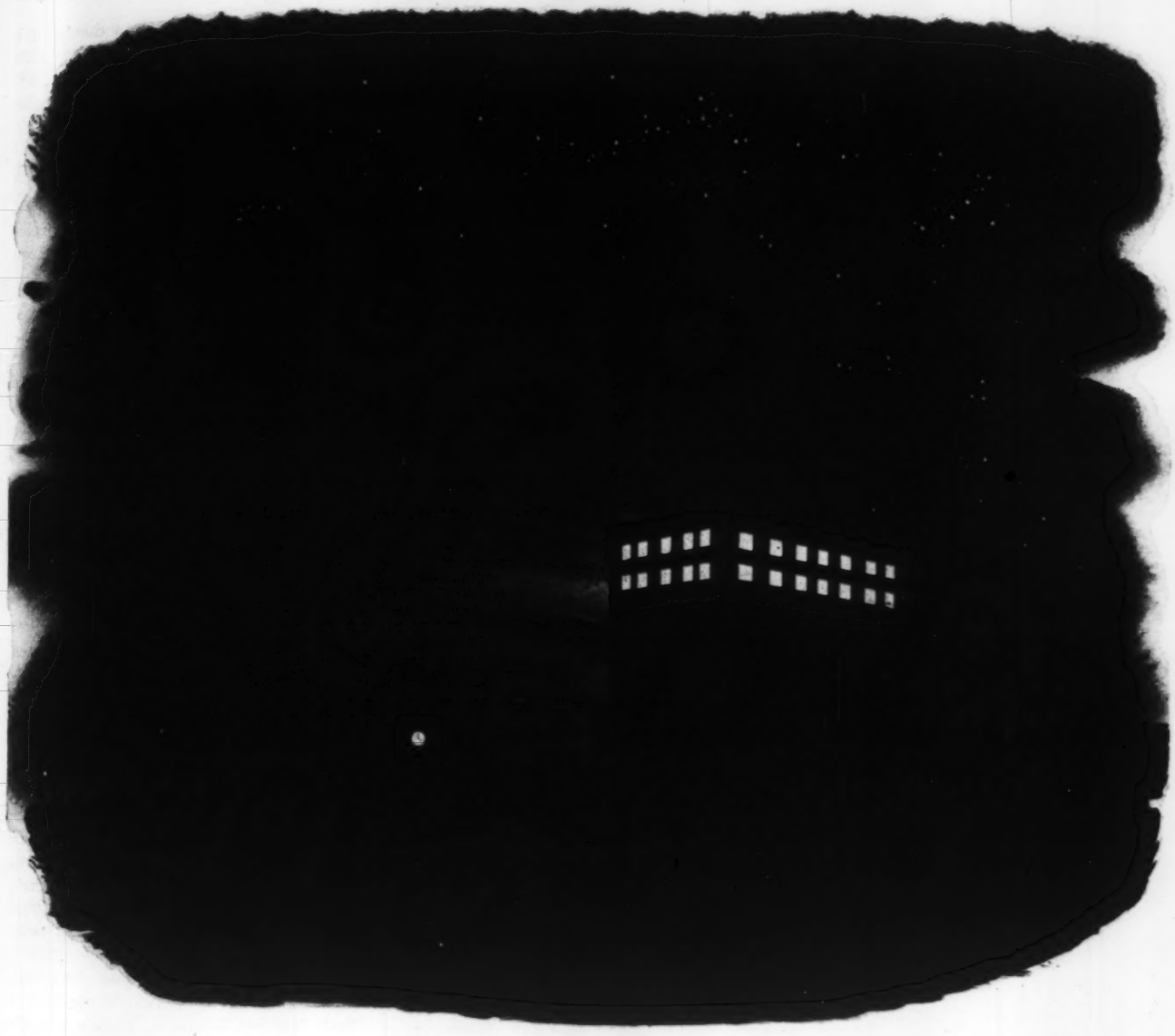
Fred M. Shelley Jr. has been appointed general sales manager, and **Alfred G. Dennison as assistant** general sales manager, **Riverside Metal Co.,** Riverside, N. J. Mr. Shelley has been with the firm for 30 years. He set up the company's first regional sales office in the New York area in 1919, and has since been manager of that office. Mr. Dennison joined Riverside in 1945, and has been active in sales and advertising. He previously was a district manager, Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co. **George Peterson Jr.** was appointed manager of the company's new special products division.

—o—

P. J. Slavish has been appointed manager, Pittsburgh office, **Baldwin Locomotive Works.** He has been with headquarters sales of Standard Steel Works Division of Baldwin at Burnham, Pa., in various capacities for the last 16 years. **A. B. Irwin,** who headed the Pittsburgh office since it opened in 1944, has been transferred to Philadelphia to handle industrial sales for Standard Steel Works Division in that area.

—o—

Westinghouse Electric Corp., Pittsburgh, announces appointment of: **Burt S. Burke as manager,** lighting division, with headquarters in Cleveland; **A. L. Paquette,** manager of aviation products, with headquarters in Dayton, O.; **John W. Simpson,** assistant engineering manager, atomic power division, Pittsburgh; **Frank E. Heikkila,** assistant industrial sales manager of the corporation, with headquarters at the East Pittsburgh office; **Stanley S. Schneider,** engineering manager, district engineering and service department, East Pittsburgh; **John F. Morten,** advertising and sales promotion manager, Sturtevant Division, Hyde Park, Mass.; and **Glenn A. Caldwell,** engineering



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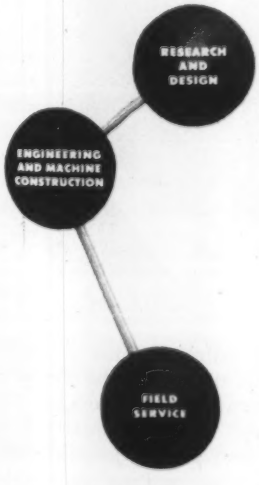

There's no problem like your problem and we strive for immediate solution. We support this conception of *Urgent Service* with offices in strategic locations, willingness to burn the lamps all night, if necessary, to meet your vital deadlines, and Company-owned aircraft ready to fly our engineers and executives to you on a moment's notice.

Lombard "Packaged Engineering" embraces the entire responsibility of complete plant or machine design... plus construction and installation where required. Give us your toughest construction or mechanical engineering problem and we'll develop the practical, efficient method or process for your profitable production. Trained engineers supervise machinery installation, stay on the job until the equipment is performing the job we designed it to do... that you expect it to do!

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supervisor, Detroit engineering and service department, with headquarters in Detroit.

—o—

Roy A. Curl has been appointed manager, sales promotion department, **Youngstown Sheet & Tube Co.,**

ROY A. CURL

Youngstown, succeeding **Myron S. Curtis,** recently appointed assistant to the president. Mr. Curl joined the company in 1925 and for the last 15 years has been assistant to the sales promotion manager. **Clyde M. Horan,** for the last nine years superintendent of blast furnaces at the company's plant at Indiana Harbor, has been transferred to the Youngstown district as superintendent of company blast furnaces at Campbell and Hubbard and sintering plant at Campbell.

—o—

Harlen F. Mura, Northeast Equipment Co., Cleveland, has been appointed Ohio district representative for the Industrial Furnace Division of **R-S Products Corp.,** Philadelphia.

—o—

Carlton H. Rose, head of National Lead Co.'s specification department, has been appointed representative of the **American Society for Testing Materials** on the Standards Council of American Standards Association.

—o—

Frederic Leake Jr. has been appointed assistant manager, Evans Lead Division, **National Lead Co.,** New York. He had been sales manager of the division.

—o—

George R. Best, F. H. McGraw & Co,. New York, has been appointed manager of the engineering and construction firm's Pittsburgh office to succeed **Francis J. Tytus,** resigned. A veteran in steel mill construction and mill erection, Mr. Best was McGraw's superintendent on the recently completed Tennessee Coal & Iron modernization project at Fairfield, Ala. McGraw's engineering department has been transferred from Pittsburgh to Hartford, Conn., and the Pittsburgh office is now an operational office. **Ted Page** will serve as assistant to Mr. Best.

—o—

George C. Connor has been appointed general sales manager, photoflash division, and **Alfred C. Viebranz,** general sales manager, electronics division of **Sylvania Electric Products Inc.,** New York.

—o—

E. L. Johnson has been appointed sales manager, **Palnut Co.,** Irvington, N. J. He joined the company eight years ago, and had formerly served in capacities of salesman and assistant sales manager.

—o—

T. Embury Jones, president, **Precision Welder & Machine Co.,** Cincinnati, has been elected president, Resistance Welder Manufacturers Association.

T. EMBURY JONES

Long active in the R.W.M.A., he recently completed a term as vice president. **B. L. Wise,** director of production, National Electric Welding Machines Co., Bay City, Mich., was elected chairman of the advisory board; and **H. V. Beronius,** secretary, Welding Machines Mfg. Co., Detroit, was elected vice president of the association.

—o—

Charles E. Love, general sales manager, **International Business Machines Corp.,** New York, has been elected vice president in charge of sales. He has been with the company since 1932. He served in several sales executive capacities at Portland, Me., Peoria, Ill., and Chicago, subsequently became instructor of sales in the IBM employees' training school at Endicott, N. Y., and then served successively as electric accounting machine division manager in Boston and Chicago. After service with the U. S. Navy from which he was discharged in 1946, Mr. Love returned to IBM as sales manager of its western district, and was appointed general sales manager in 1947.

—o—

Edward Manhard has been elected chairman of the board of directors, and **Charles R. Roberts** as president of **Rock Island Bridge & Iron Works Inc.,** Rock Island, Ill.

—o—

Randall Snow has been named assistant general sales promotion manager of **Walker Mfg. Co.,** Racine, Wis. He has served as an assistant to **T. F. Hall,** sales promotion manager, since joining the organization in 1946.

—o—

Chicago-Latrobe Twist Drill Works, Chicago, announces that **Frank Sullivan** has joined the company as a sales and service representative for the New England territory.

—o—

John P. Richmond has been elected to the newly created post of comptroller, **Shippers' Car Line Corp.,** subsidiary, American Car & Foundry Co., New York. He also is comptroller of the parent company.

—o—

Clinton E. Swift, welding engineer specialist, has rejoined **American Brass Co.,** Waterbury, Conn., and will have a leading part in the company's stepped up research and promotional activities on Anaconda welding rods.

—o—

James F. McCartney has been appointed general sales manager of **Duff-Norton Mfg. Co.,** Pittsburgh. He will be in charge of all industrial,

JAMES F. McCARTNEY

mining and railroad sales of Duff-Norton jacks. Since 1948 he has been eastern district sales manager for the company, with headquarters in New York, and before joining Duff-Norton he was eastern representative for Pressed Steel Car Co.

R. A. Roosevelt has been appointed sales manager of **Eriez Mfg. Co.**, Erie, Pa. He has been advertising manager of the company, and will continue in that capacity.

—o—

Fred W. Schlapp has been appointed sales engineer for **Ajax Electric Co. Inc.**, Philadelphia. He will maintain offices in San Francisco, from which he will cover northern California and all of Nevada.

—o—

Whiton Machine Co., New London, Conn., announces that **O. D. H. Bentley** has become associated with it as consulting engineer on steam turbines, and **Eugene B. Williams** also joins the company in charge of the sale of Whiton steam turbines for U. S. Navy applications.

—o—

K. A. D. Naoroji, president of **Tata Inc.**, New York, since 1945, has returned to India where, as a director of Tata Industries, he will be located in New Delhi. He came to the United States originally in 1943 on loan from Tata as director of supplies of the India Supply Mission in Washington.

—o—

Elwood Broadwater has been appointed director of public relations for **Salem Engineering Co.**, Salem, O. He was news editor of radio station WCMW in Canton.

—o—

Fedders-Quigan Corp., Buffalo, announces appointment of **Anthony J. DeFino** as general manager of its Buffalo division. He has held key positions in various phases of the company's sales and manufacturing activities centering around heat transfer equipment.

JAMES L. HYLAND

Named chairman of Republic Steel Corp.'s open-hearth committee. Noted in STEEL, Jan. 23 issue, p. 53

ELMER A. SCHWARTZ

Appointed Cleveland district manager, Republic Steel Corp. Noted in STEEL, Jan. 23 issue, p. 53

—o—

Joy Mfg. Co., Pittsburgh, announces appointment of **R. G. Gehlsen** as sales manager, mines equipment division, and **H. B. Zeppenfeld** as manager, industrial sales, mines equipment division.

—o—

James A. Setchell has been appointed San Diego, Calif., representative of **Allen-Bradley Co.**, Milwaukee. He will operate under his own name at 301 W. "G" St.

—o—

Heyl & Patterson Inc., Pittsburgh, announces appointment of **Orville R. Lyons** as coal preparation engineer. For the last four years he has served as research engineer in charge of coal preparation at Battelle Memorial Institute, Columbus, O.

—o—

Robert E. Hamilton, vice president, **Stone & Webster Engineering Corp.**, New York, retired after 48 years with the organization.

—o—

Harry Oldham has been appointed foundry superintendent of **Hunt-Spiller Mfg. Corp.**, Boston, subsidiary, A. S. Campbell Co. Mr. Oldham was with Ford Motor Co. for 23 years, and more recently was general foundry superintendent for Mack Mfg. Corp., New Brunswick, N. J.

OBITUARIES...

Clarence B. White, 65, president, **White Bros. Smelting Corp.**, Philadelphia, died Jan. 21 at his home in Hallowell, Pa., after a short illness. Long prominent in the nonferrous field, he was a pioneer in the manufacture of ingot metals and was one of the founders of the Nonferrous Ingot Metal Institute. He was also a founder and charter member of the National Association of Waste Material Dealers and a member of the Philadelphia Metals Association. He served as president, New York Metal Exchange, 1923-1925.

—o—

Robert C. Todd, 68, retired vice president, **Armco Steel Corp.**, Middletown, O., died Jan. 19. He had been with the company since it was formed, and acted as a consultant following his retirement two years ago.

—o—

Lewis C. Dunn, 64, consulting engineer for **E. F. Houghton & Co.** at Detroit, and a pioneer heat treating expert, died recently in that city. Prior to the first World War he was associated for many years with Packard Motor Car Co.

—o—

E. S. Rooney, Cincinnati district manager, **Automatic Nut Co.**, Lebanon, Pa., died of a heart attack Jan. 15. He represented the company for the last 15 years.

—o—

Dow G. Roof, 56, former industrial relations manager, Stamford Division, **Yale & Towne Mfg. Co.**, Stamford, Conn., died Jan. 17. He retired because of ill health in 1949.

—o—

Edwin S. Heatherton, 58, superintendent of the coach department, **Packard Motor Car Co.**, in New York, died Jan. 16.

—o—

L. K. Simons, 54, vice president and manager, **R. D. Bracken Co.**, Sanford, N. C., died of a heart attack Jan. 11. He was associated for 20 years with Reading Iron Co., Philadelphia, and Alan Wood Steel Co., Conshohocken, Pa., until July, 1947, when he became associated with R. D. Bracken Co.

—o—

William Richardson Jr., 69, retired mechanical engineer, **Tennessee Coal, Iron & Railroad Co.**, Birmingham, U. S. Steel Corp. subsidiary, died recently. He was employed by T.C.I. from 1911 until his retirement in 1945.

—o—

William E. Fice, 56, sales manager, **Pease Foundry Co.**, Toronto, Ont., Canada, died Jan. 16.

—o—

Roger W. Leason, 50, vice president and treasurer, **Emsco Derrick & Equipment Co.**, Los Angeles, died Jan. 12.

—o—

William B. Knight, president and founder of **W. B. Knight Machinery Co.**, St. Louis, died Jan. 7.

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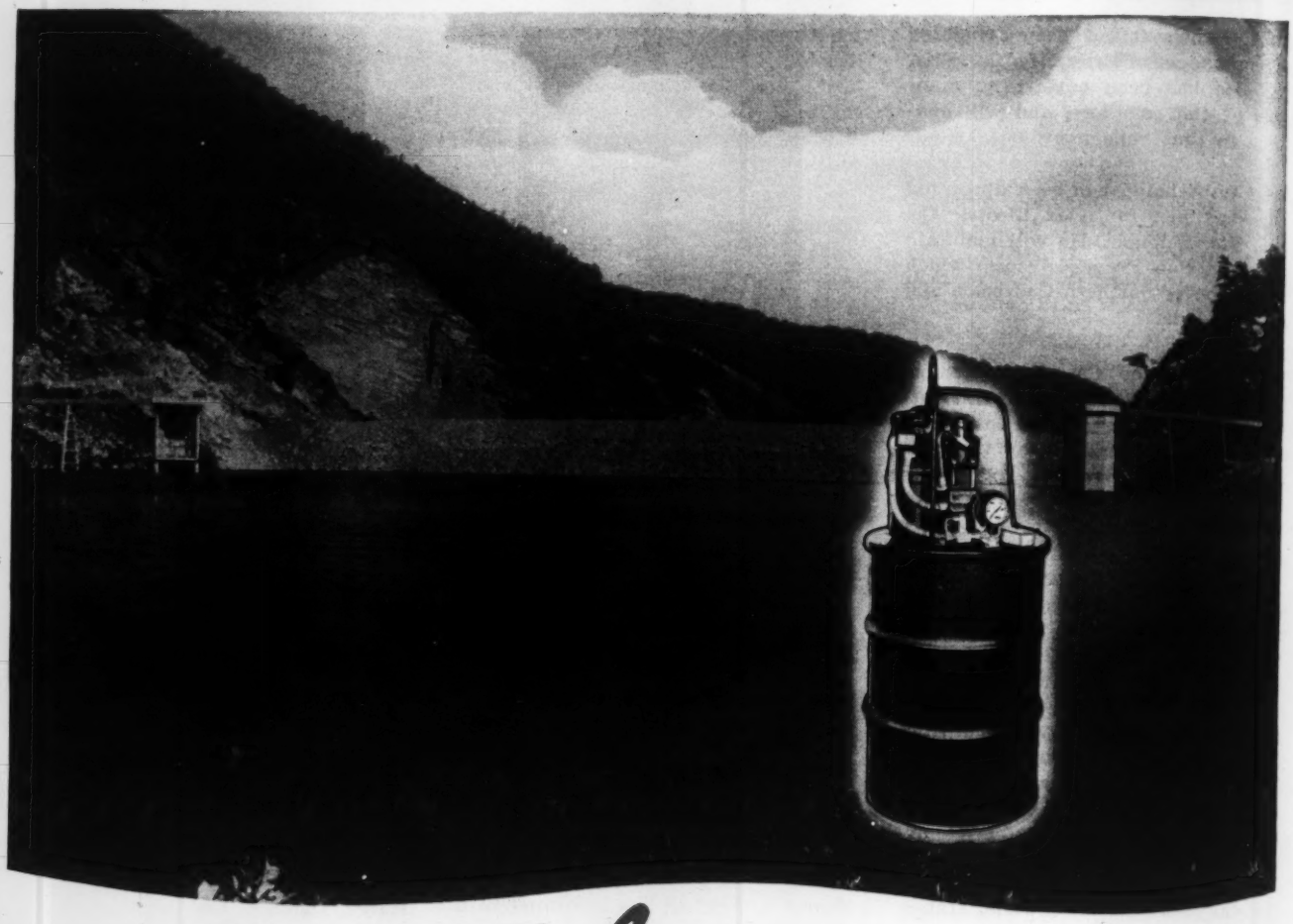

Trabon LUBRICATES 264 BEARINGS AUTOMATICALLY ON WATAUGA DAM

Installation of two Trabon Barrel Pumps on Watauga Dam in Tennessee, an important link in the TVA power and flood control program, solved a lubricating problem which rivaled the dam in size.

The pumps are installed in a powerhouse approximately one mile from the dam site and serve to lubricate turbines which control the intake and linkage mechanism. No manpower is needed to operate the system, equipped with a warning device, which flashes a warning of any interruption in the proper flow of grease to each bearing.

WRITE FOR BULLETIN 469

Trabon systems have ONE indicator at the pump, assuring positive lubrication. Trabon systems operate efficiently when buried under dust, dirt, water, or grime.

Regardless of the size or type of your machine, Trabon — with 20 years of experience — can save you time and money.

Call or write today.

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Production AND Engineering
NEWS AT A GLANCE

INCREASES INGOT YIELD— Ingot mold yield in the production of "killed" steels was increased by one steel producer from 77 to 78 per cent to nearly 85 per cent in using a carbon-free exothermic liquidizer compound developed by Pittsburgh Metals Purifying Co., Pittsburgh. In tests conducted by the steel company, involving 8 x 8 to 14 x 32-inch ingots weighing 9000 pounds, it is estimated that a saving of $4 was made for each dollar spent on the liquidizer. Use of the compound by a major stainless steel producer increased weight of stainless billets by 340 pounds on 6000-pound ingots, and increased length of the same billets as much as 15 inches.

SO YOU'RE HOT?— Firms with fire hazards, please take note! Firefighting suit designed to keep firemen at a cool 130° while working in flaming inferno of gasoline and oil that registers a sizzling 2000° F was successfully tested by United States Air Force Engineering Division at Wright-Patterson Air Force Base, Dayton, O. Only one of its kind so far developed, suit is made up of 18 layers glass fiber, glass fiber batt and net, Neoprene coated glass fiber, honeycombed cotton cloth, silver and aluminum foil and nylon. In all it's about ½-inch thick.

RECORDS MINUTE CURRENTS— New instrument now being used to detect nuclear-energy—one capable of measuring to 100 millionths of a millionth of an ampere—is getting considerable attention among scientists and research engineers because of its potential applications in other fields. Designed by Brown Instruments division, Minneapolis-Honeywell Regulator Co., device measures and records flow of current or radiation without attendants with maximum deviation from accuracy never being more than 0.3 millivolts in one day—and even this is minimized by periodic manual zeroing.

SALVAGING PROCESS— Collets and feed fingers normally worn oversize now can be reworked to provide longer life by a process developed by S & E Machine Products Inc., Bridgeport, Conn. Method restores the components to the precision of a new part. In the process carbide wear sections are inserted and ground to new collet dimensions. Furthermore, no annealing is involved and original hardness and temper are not appreciably changed. The reworking is especially adapted to collets employed in high speed automatic work or similar long run applications. Users say the reworked collets give up to 50 times the life of the original steel collets.

MEASURES NEUTRON RADIATION— Neutron radiation intensities in terms of a common reference value now can be measured by all laboratories by means of a primary neutron standard devised by National Bureau of Standards, Washington. Standard consists of a solid beryllium sphere, 4 centimeters in diameter, enclosing at its geometrical center a capsule of radium. Neutrons are produced in the sphere by action of gamma rays from the radium. Because rate of neutron emission changes slowly as radium decays, the change is only about 0.04 per cent a year, and can be taken into account with sufficient accuracy. A duplicate standard is available on a loan basis to other research labs requiring standardization of their neutron measurements.

TWO-MINUTE RESULTS — Attempts to analyze phosphorus in steel using the time-saving spectrographic technique thus far presented many difficulties. But, a method worked out at Ford recently permits an operator to make a single phosphorus determination in 2 minutes. The set-up involves the use of a spectrograph and two Geiger-Muller counters. The latter are attached to the spectrograph at the plateholder position, replacing the photographic plates usually employed. (p. 46)

SIMPLIFIES DESIGNS—Design of weldments employed in fabricating cranes in an Alliance, O., plant is simplified with the use of a 500-ton press brake. The unit is used to shape components to simplify fitting. For example, by bending up each edge of a foot walk plate, the product is easier to produce. Previously, the walk was made up of plate with angles welded along each side with filler bars at the support. The bent type walk is stiffer, better looking and affords much production savings. (p. 50)

MODERATE PRODUCTION — Coils of ferrous or nonferrous metal are flattened and cut to any length by a shear line of moderate production designed by E. W. Bliss Co. Shear is built so that only one adjustment compensates for both side and end wear. Complete unit consists of coil stop, payoff reel, roller leveller, looping table, upcut shear, gage table and automatic gage unit, oiling unit, pinch rolls and sheet piler. (p. 54)

NOTICEABLE IMPROVEMENT — Contrasting the facilities, equipment and product of a modern steel foundry with those of the best steel foundry of 20 years ago is like comparing the modern streamlined motorcar with the primitive horseless carriages. Today steel foundries are mechanized in all departments and considerable study is given to new developments in mechanization. Method used to produce steel castings, however, is not standardized. There are about four different techniques employed. The chosen method depends on the organization's policy, tonnage required, intricacy of castings, type of steel required, to name a few. (p. 60)

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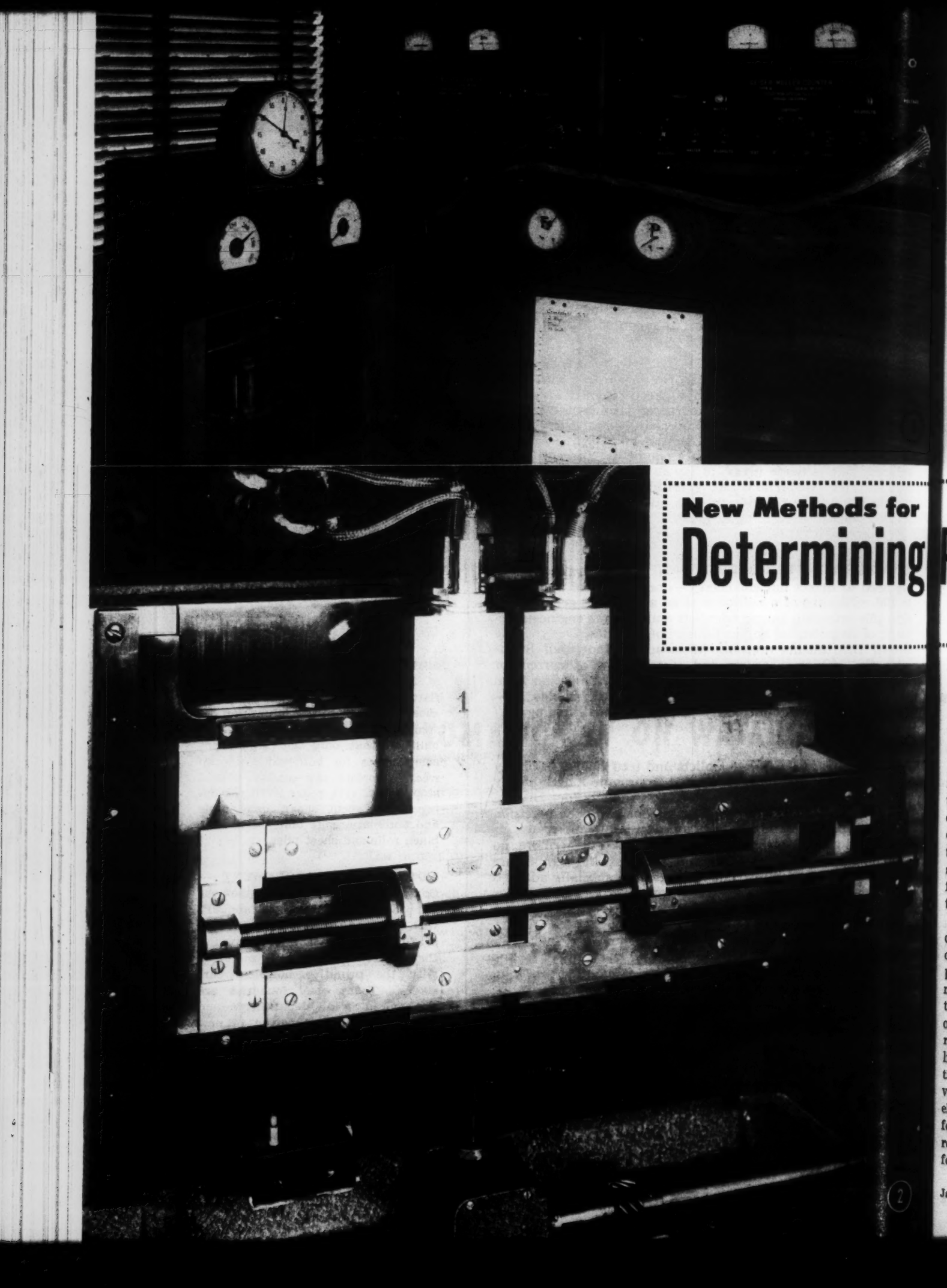
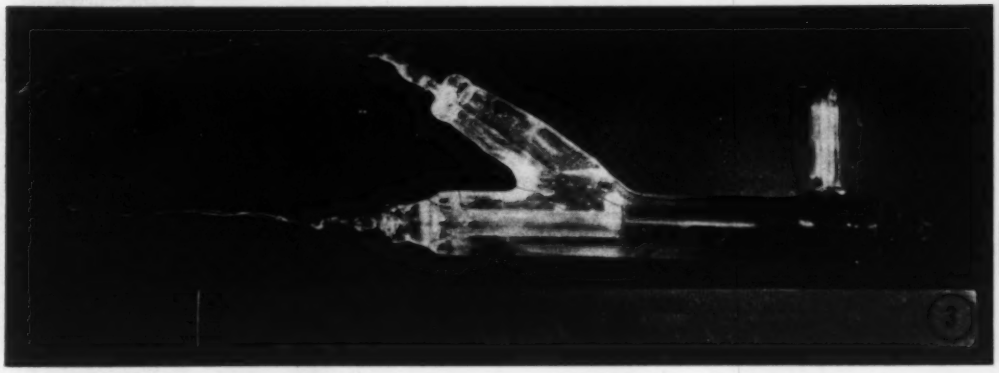


New Methods for Determining

Fig. 1—Production control installation at Ford Motor Co. for determining phosphorus in steels, using Geiger-Muller counter method

Fig. 2—Geiger-Muller counter attachment as mounted on the spectrograph

Fig. 3—Quartz Geiger counter tube that is used in phosphorus determination



Spectrographic method using Geiger photoelectron tubes was recently adopted for production control of phosphorus in steels at Ford Motor Co. A single phosphorous determination can be made in 2 minutes, using the new nonmechanical process. Refinements in chemical techniques are also reported here

Phosphorus In Steels

METALLURGISTS familiar with melting specifications for iron and steels fully realize that they invariably call for accurate controls regarding maximum limits for phosphorus. The spectrographic method has been applied with widespread success to the determination and control of many of the elements encountered in iron and steelmaking. However, attempts to analyze phosphorus in steel using the time-saving spectrographic technique have presented many difficulties. Only recently was a successful method reported in use for production control at the Ford Motor Co.[1]

The development is based on work originally conducted in 1942 by Duffendack and Morris,[2] University of Michigan, who reported the use of Geiger-Muller photoelectron counter tubes for the quantitative measurement of spectral lines of wave lengths less than 2600 Å. Since it was recognized that this type of Geiger-Muller tube is sensitive to the wave-length region containing some of the most usable phosphorus lines, a project was initiated by Ford Motor Co., with the department of engineering research of the University of Michigan to provide Geiger-Muller photoelectron counters and suitable measuring apparatus for analyzing phosphorus in ferrous alloys.[3] Recent refinements have also been made in chemical methods for the determination of phosphorus in alloys. Work carried out by J. L. Kassner and M. A. Ozier, University of Alabama, and reported before the fourth annual analytical symposium of the American Chemical Society, held in Pittsburgh, showed that the time for a complete phosphorus determination can be shortened by using a citromolybdate solution and separating the ammonium malybdiphosphate at the boiling point. The work, which was sponsored by a grant from the research fund of the University of Alabama indicated good results when the method was applied to the analysis of several Bureau of Standards samples.

Geiger-Muller Counter Method—Equipment developed by Bryan and Nahstoll for production control in the laboratories of Ford Motor Co. permits an operator to make a single phosphorus determination in 2 minutes, or 30 in an hour, and consists of the following apparatus: (1) An electrical arc source; (2) a large Littrow quartz spectrograph; (3) the Geiger-Muller counter attachment with its associated electrical circuits. Fig. 1 shows a typical installation mounted on a chemical laboratory bench. In contrast to the typical spectrographic installation, this equipment does not require a dark room with photographic processing equipment nor microphotometering facilities.

The excitation source, according to Bryan and Nahstoll, is preferably an arc, since the phosphorus line used (2136.19 Å) is of high arc intensity and is situated very close to a copper line (2135.97 Å) of high spark intensity. Arc excitation has the further advantage of not interfering electrically with the electronic measuring circuits. Both the direct current and alternating current arcs have been used, although it has been pointed out that the direct current arc required more elaborate operating precautions in order to obtain satisfactory accuracy. In either case, it is a good policy to have a separate motor generator set to supply the power, and ballast should be of the constant resistance type.

Spectrograph Used—Spectrograph used in Ford

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Motor Co. laboratories for phosphorus determination is a Bausch and Lomb Littrow instrument with quartz optics adjusted to bring the "tenth region" into focus, thus providing a reciprocal dispersion of about 1.4 Å per mm for lines of 2100 to 2200 Å wave length. In order to control the temperature of the instrument, and thus prevent shifting of the spectral line positions, the complete spectrograph is enclosed in an insulated wooden cabinet with constant temperature control which serves as a thermostat.

Two Geiger-Muller counters are attached to the spectrograph at the plateholder position. They replace the photographic plates usually employed. This attachment is shown in Fig. 2. The box-like containers shown are equipped with receiving slits and counter tubes aligned to accommodate incident light beams striking the focal plane at an angle of about 65 degrees from the normal. These tube containers are movable along a screw having 24 threads to the inch, allowing reproducible location of the slit and tube positions to within 10 microns.

Geiger Tube—Geiger tube used in the analysis is shown in Fig. 3, and is based on the work of Duffendack and others[3,4] who applied such tubes to the measurement of spectral lines. The tube is exceptionally small, being about 12 cm in length and 13 mm in diameter. Electrical elements of the tube consist of a cylindrical nickel alloy cathode and a fine tungsten wire anode supported within a tubular quartz envelop filled with pure hydrogen gas at 10 cm pressure. Tubes of this kind have been in use in the Ford laboratories for more than 2 years without noticeable change in sensitivity or operating characteristics.

Each tube requires a group of associated electronic circuits for counting. Pulses from the tubes are quenched externally by means of a Neher-Harper[5] circuit. These isolated pulses which are very feeble and may occur at a rate too rapid for mechanical registering, are next fed into a scaling circuit described as of Lifschutz[6] design which produces one powerful pulse for each eight original weak pulses. The high voltage regulated power supply for the Geiger tube is also incorporated with the scaling circuit. The pulse delivered from the scaling circuit then drives a solenoid-operated impulse register to totalize the number of counts per unit time.

Although the counting rates involved in measuring spectural lines are not high, the random occurrence of the pulses necessitates consideration of the electrical resolution[7] of counts occurring at nearly the same time. The combined electrical circuits will count accurately as many as 3600 equally spaced, scaled counts per second; however, the probability of coincidence in counting random pulses contributes an error which is quite significant at rates above 500 scaled random counts per minute. In addition, in measuring random counts, accuracy of measurement is dependent on the total number of pulses counted; generally, errors tend to increase with a decrease in total counts registered. In the work at the Ford laboratories a provision for the interpolation of registered counts is incorporated in the counting circuit used.

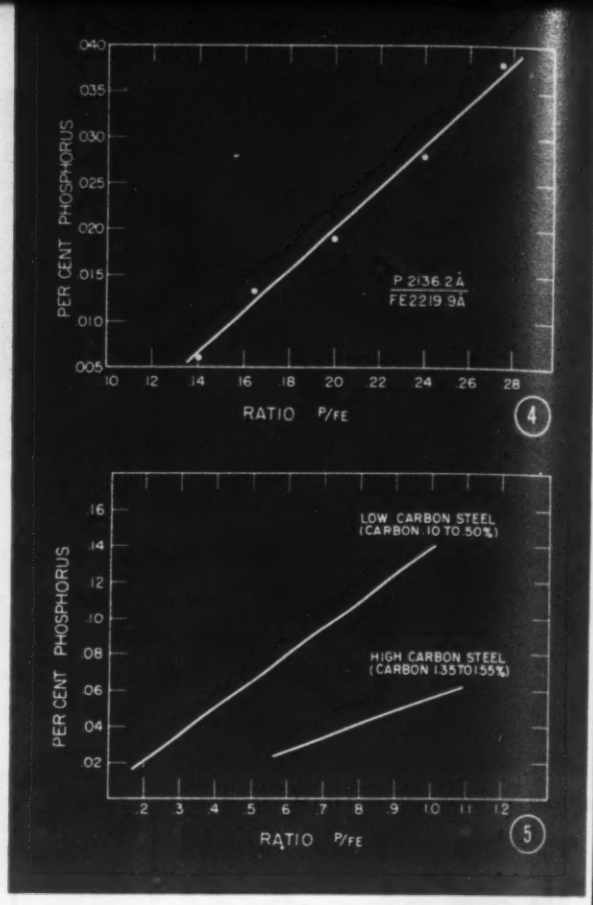

Fig. 4—Working curve used in Ford laboratories for analysis of low phosphorus steels

Fig. 5—Laboratory curves for use with steels of different carbon contents

Carrying out an Analysis—According to the procedure recommended by Bryan and Nahstoll of Ford in a recent ASTM bulletin, the molten metal to be analyzed is poured into molds to provide rod-shaped self electrodes having the following recommended properties: (1) Diameters uniform to 0.005-inch; (2) lengths of at least 0.625-inch and (3) burning tips consisting of 90-degree cones. These specifications are neceessary in order to restrict errors to within 5 per cent of the amount of phosphorus present. After the adoption of a usable diameter, it is important to maintain uniformity of samples in respect to each other and to standards employed. Data have been presented[8] to show that the ratio of phosphorus counts to iron counts varies inversely as the electrode diameter; thus, small changes in diameter affect counting results.

A grinding operation to remove 45 degrees of metal as measured from a plane perpendicular to the length of the electrode forming a conical burning tip of 90 degrees is recommended. Without a sharp conical point, there is a definite tendency toward arc wandering, which in prism instruments can result in considerable variation of quartz absorption and poor reproducibility of readings. Proper attention should be given to accurate spacing of the sample electrodes.

To provide reproducibility within 5 per cent of the amount of phosphorus present, it is necessary to maintain gap spacing within plus or minus 0.005-inch from sample to sample.

Source Conditions — Both alternating and direct current arcs have been used in production control applications of the technique with currents from 1.5 to 3.5 amp. A 2200-v ac arc of 2 amp has been found satisfactory for most samples. After optimum current value is chosen, it is important that suitable regulation be maintained to hold the current constant within 0.05-amp.

In carrying out phosphorus analysis in the Ford laboratories, the arc is positioned 35 cm from the entrance slit of the spectrograph. The spectrograph entrance slit is adjusted to 30 microns in width and 7 mm in height, while exit slits attached at the spectrograph focal plane are 200 microns wide and 6.3 mm high. Work has shown that entrance slit width of more than 30 microns prevent sufficient resolution for the steel spectrum, and narrower widths reduce sensitivity.

It is important that the entrance and exit slits be made parallel to each other. This can be done by narrowing the exit slits to the width of a line and by rotating the entrance slit housing to a position where a maximum count is obtained. The spectrograph focus and tilt adjustments are set to accommodate the 2100 Å to 2500 Å region which offers a reciprocal dispersion of 1.4 Å per mm at the position of the 2136.19 Å phosphorus lines.

Choice of Lines—Of the phosphorus lines in steel, the one at 2136.19 Å is used in Ford laboratory determinations because of its high arc intensity and relative freedom from interference. Concerning the iron reference lines, the one at 2219.9 Å is used primarily because its intensity is nearly equivalent to that of the 2136.19 Å phosphorus lines, and secondly because its proximity to the phosphorus line results in a minimum quartz absorption error. Data were published[3] to show that the ratio of intensities of two prism dispersed lines, varies less as the difference in wave length between the lines decreases.

It is desirable to control temperature of the spectrograph within 2° F in order to prevent errors in the measurements.

Electronic Units—The electronic circuits attached to each Geiger-Muller tube must be adjusted according to the characteristics of the particular tube with which they are associated. A variable direct current voltage supply is used first to determine the operating plateau of the tube. The voltage is then set for regulation at the midpoint of the plateau and both voltage and stabilizing knobs locked into position to avoid accidental overvoltage, which may injure the tube or result in an error. Experience at the Ford laboratories has indicated that once the operating voltage is established, it may be possible to employ a given tube for more than 2 years without altering this voltage.

Exposure Time—During a 1-minute arcing of most steels, sufficient phosphorus counts are produced to provide acceptable accuracy. Terminating the exposure at the time 100 reference counts are accumulated has proved to be satisfactory compromise in routine control work at the Ford Motor laboratories as regards speed and accuracy of analysis, as well as being an expeditious means of calculating ratios and drawing up working curves.

By using electrodes of known analysis, readings obtained from the registers provide phosphorus to iron count ratios which may be plotted against the known percentages of (*Please turn to Page* 56)

TABLE I
RESULTS OBTAINED USING GEIGER COUNTER AND ROUTINE CHEMICAL ANALYSIS—2200-V ALTERNATING CURRENT ARC USED

Type of Sample	Rod Diameter, in.	Chemical Analysis, per cent phosphorus	Geiger Counter Analysis, per cent phosphorus
Low carbon No. 1 ..	¼	0.007	0.008/0.009/0.008/0.008
Low carbon No. 1 ..	⅛	0.011	0.015/0.014/0.012/0.014
Low carbon No. 2 ..	¼	0.010	0.009/0.010/0.008/0.009
Low carbon No. 2 ..	⅛	0.009	0.008/0.012/0.011/0.012
Low carbon No. 3 ..	¼	0.013	0.012/0.012/0.009/0.011
Ford EEEE	¼	0.019	0.020/0.019/0.018/0.020
Crankshaft metal ..	¼	0.046	0.053/0.047/0.054/0.053
Crankshaft metal ..	⅛	0.055	0.059/0.062/0.055/0.051
Crankshaft metal ..	⅛	0.040	0.046/0.053/0.037/0.036
Crankshaft metal ..	¼	0.055	0.055/0.055/0.056/0.049
Crankshaft metal ..	⅛	0.028	0.027/0.025/0.023/0.023
Crankshaft metal ..	⅛	0.038	0.036/0.044/0.041/0.034
SAE 1111	¼	0.092	0.103/0.099/0.085/0.083
SAE 1111	⅛	0.145	0.133/0.137/0.139/0.134
SAE 1111	¼	0.108	0.101/0.104/0.114/0.109
SAE 1111	⅛	0.088	0.105/0.108/0.106/0.107
Rimmed steel	⅛	0.005	0.007/0.006/0.005/0.009
Rimmed steel	⅛	0.006	0.013/0.011/0.014/0.010
Cupola AA iron	⅜	0.17	0.169/0.162/0.175/0.163
Cupola AA iron	⅜	0.17	0.168/0.165/0.176/0.168
Cupola AA iron	⅜	0.165	0.164/0.161/0.157/0.167
Cupola B iron.....	⅜	0.20	0.185/0.183/0.180/0.190
Cupola B iron.....	⅜	0.19	0.195/0.187/0.204/0.190
Cupola B iron.....	⅜	0.19	0.197/0.205/0.203/0.195

TABLE II
GEIGER COUNTER RESULTS ON FOUNDRY SAMPLES AT FORD MOTOR CO.
—DIRECT CURRENT ARC USED—

Type of Sample	Determinations	Concentration Range, per cent phosphorus	Maximum Deviation from Chemical Analysis, per cent phosphorus	Average Deviation from Chemical Analysis, per cent phosphorus
Cupola iron	109	0.10 to 0.25	0.035	0.013
Electric furnace preliminaries cast in iron	96	0.02 to 0.07	0.018	0.006
Electric furnace preliminaries cast in molybdenum	15	0.02 to 0.07	0.005	0.002

TABLE III
ANALYSIS OF STANDARD STEELS, SOLUBLE IN NITRIC ACID, USING IMPROVED CHEMICAL METHOD DEVELOPED AT UNIVERSITY OF ALABAMA

Bureau of Stds. Sample No.	Type	Certified Phosphorus Value, %	Exptl. Phosphorus Value, %	Deviation %
8g	Bessemer Steel	0.093	0.093	0.000
10e	Bessemer Steel	0.083	0.083	0.000
			0.081	—0.002
129A	Bessemer Steel	0.094	0.091	—0.003
			0.098	+0.004
			0.091	—0.003
11e	B.O.H. Steel	0.015	0.015	0.000
			0.012	—0.003
15D	B.O.H. Steel	0.018	0.017	—0.001
21C	A.O.H. Steel	0.062	0.060	—0.002
			0.063	+0.001

TABLE IV
RESULTS OBTAINED BY IMPROVED CHEMICAL METHOD ON STEELS INSOLUBLE IN NITRIC ACID

Bureau of Stds. Samples No.	Type	Certified Phosphorus Value, %	Exptl. Phosphorus Value, %	Deviations %
30c	Cr-V Steel V=0.235%	0.019	0.020[m]	+0.001
			0.021[m]	+0.002
			0.014[n]	—0.005
32b	Cr-Ni Steel	0.016	0.015	—0.001
			0.014	—0.002
100	Mn Rail Steel	0.023	0.020	—0.003
			0.021	—0.001
106A	Cr-Mo-Al Steel	0.016	0.018	+0.002
			0.014	—0.002
111A	Ni-Mo Steel	0.017	0.020	+0.003
			0.016	—0.001
121A	Stainless Steel 18% Cr, 10% Ni Titanium Bearing	0.023	0.020	—0.003
			0.022	—0.001

[m] Reduced with ferrous sulphate, allowed to stand overnight before filtering, used 150 ml double-strength citromolybdate solution
[n] Reduced with ferrous sulphate, filtered immediately, used 150 ml double-strength citromolybdate solution

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STEEL WELDMENTS

. . . modify crane fabrication, lower production costs

This organization has found that the use of weldments offers them lighter, better looking crane components together with attendant production savings. However, for some specific parts, a combination of both weldments and castings produces the best product at the most reasonable cost

By DAN REEBEL
Associate Editor, STEEL

UTILIZATION of weldments wherever possible together with a unique materials handling setup is affording easy, fast production and movement of gigantic crane components in and between the plants of Alliance Structural Co. and Alliance Machine Co., Alliance, O. Their novel welding and handling setup is one that affords a great amount of operational flexibility together with a minimum of materials handling. A huge storage yard located between the two plants stocks and retains both raw materials and finished products until the machine plant requires them for final erection.

Material moving through the plant is carried by an overhead electric crane to a track running between the two shops and placed on dollies which transport it into the shop. All templets are made in the leanto portion of the shop with shears for cutting plates and angles, punches, a 500-ton press brake and necessary burning equipment being located in the east end of the shop. These are used for basic processing of structural steel into sizes and shapes required for fabrication into finished products, such as huge cranes and other special purpose machines and equipment which the organization designs and constructs for clients the world over.

Across the storage yard and connecting the two plants runs a previously mentioned track, which is elevated slightly in the structural shop and which with the aid of gravity delivers material down into the lower machine shop. Material while in the shop is handled by means of 5 and 10-ton hoists supported from the bottom chord of each roof truss and electrically operated from the floor. Lighter hoists are used where the steel first enters the shop. At the shop's delivery-end for handling final assembled items are located 10-ton hoists.

Farther down the shop and located in a leanto are rolls and a blacksmith section, containing bulldozers and heating equipment used to shape steel in the form required, and to supplement bending performed on the press brake. In this section smaller items are fitted and welded. Certain items, where practical, are welded on a positioner located in this leanto. Those items whose size and shape are not adaptable to welding on positioners are processed on tables with light 3-ton hoists being used to position the work. These hoists also are electrically operated from the floor. When completed, smaller items are trucked to the center track, loaded on a dolly and with the aid of gravity returned to the yard for storage until needed by the machine shop on the lower level.

In the center section of the shop, certain larger structural pieces are fitted, welded, and riveted into end ties, operator and control cabs, laminated ladle hooks, columns and guide frames for soaking pit cranes, end carriages, end trucks, and many other items. These pieces are fitted on tables and stands and then positioned for welding by use of 5 and 10-ton hoists supported from the bottom chord of the roof trusses.

Customer Specifies Design—At the far end of the shop huge crane girders are fabricated. They are either of welded or riveted design as specified by the customer. Most are now being built using the welded design as this affords a lighter and more attractive girder. Girders are built up on rail stands which position the weld at a height where it is most easily performed. After being fitted and tack-welded, 10-ton hoists move the material to the other side of the shop where final welding is then completed. Work is next placed on dollies and moved down

Fig. 1—Welding a trolley frame which is lying upside down

Fig. 2—View of an end truck being welded on the table

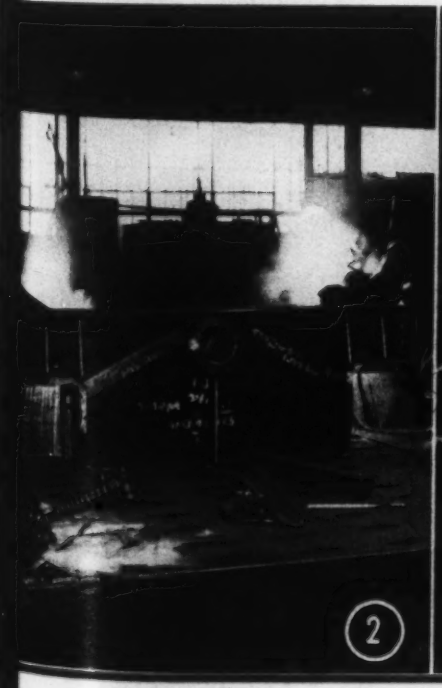
Fig. 3—Note the chain around the middle section of the trolley frame. It is fastened to a 10-ton hoist that is hung from the bottom chord of the building truss

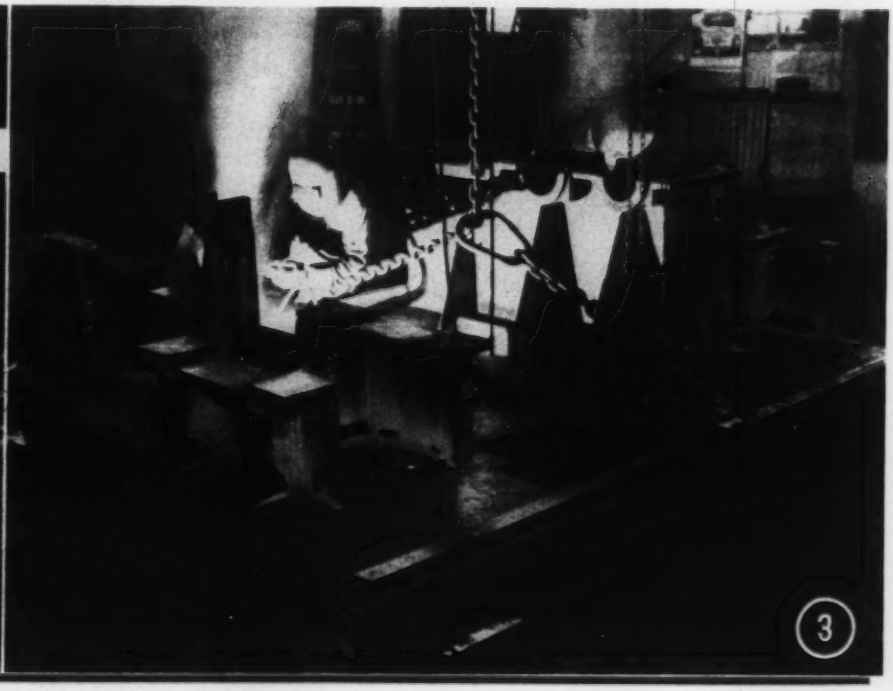
through the shop assisted by gravity. If exceptionally long girders are to be sent to the machine shop erection floor, this system is not used. Instead they are moved by dollies out of the west end of the shop, placed under a 30-ton stationary gantry-type hoist and loaded on flat cars on the railroad siding. A local railroad shifter subsequently moves them to the north end of the erection floor. All other materials in the shop are transported by dolly as previously mentioned.

Development of welding techniques has produced many changes in crane construction. Some parts, previously iron or steel castings, have been replaced with welded structural steel. Trolley frames were in most cases castings; today they are being designed larger and larger to meet expanding industry requirements. Development of welded trolley frames has resulted in a lighter and better looking product, with an attendant reduction in machine work. They are not fabricated of rolled plates and shapes alone. Small castings are incorporated as a part of the frame to serve as bearing seats, as well as in other areas where use of a weldment would result in excessive cost. It has been found that for trolleys a combination of weldment and castings produces the best product at most reasonable cost.

Crane parts that are now being made of steel weldments in place of castings are: Soaking pit crane columns, soaking pit crane guide frames, motor bases, drums, end carriages, end trucks, saddle brackets, gear housings, gears, and machinery bases of all types.

Weldments Effect Weight Reduction—Welding development has changed the design of those crane parts which used roll plates and shapes and were of riveted construction. Probably the welded girder is the biggest change in crane construction in recent years. This fabrication feature has assisted the steel industry in its expansion. Today's mills are increasing





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their tonnages; however, they are still using the same buildings and crane runways. To increase the crane's handling capacity, means excessive wheel loads on the runways. However, as their old cranes are of riveted construction, by substituting welded girders and other weldments in their new cranes, they are able to effect a weight reduction and realize an increase in lifted loads while still maintaining wheel loads which the runways will safely handle. By use of welded high-strength steels a further reduction in crane weight may also be realized. The structural plant does fabricate riveted girders when so desired by the customer.

Certain types of trolley frames previously fabricated of riveted construction, such as used for ladle cranes, are now also made of welded construction; end ties and end carriages are today being fabricated as weldments.

Majority of the welding equipment in the structural shop is of the alternating current type with a rating of 500 amp. However, some work is still handled with direct current type welding machines. Use of alternating current welders in the piants was adopted for the purpose of increasing their weldment tonnage.

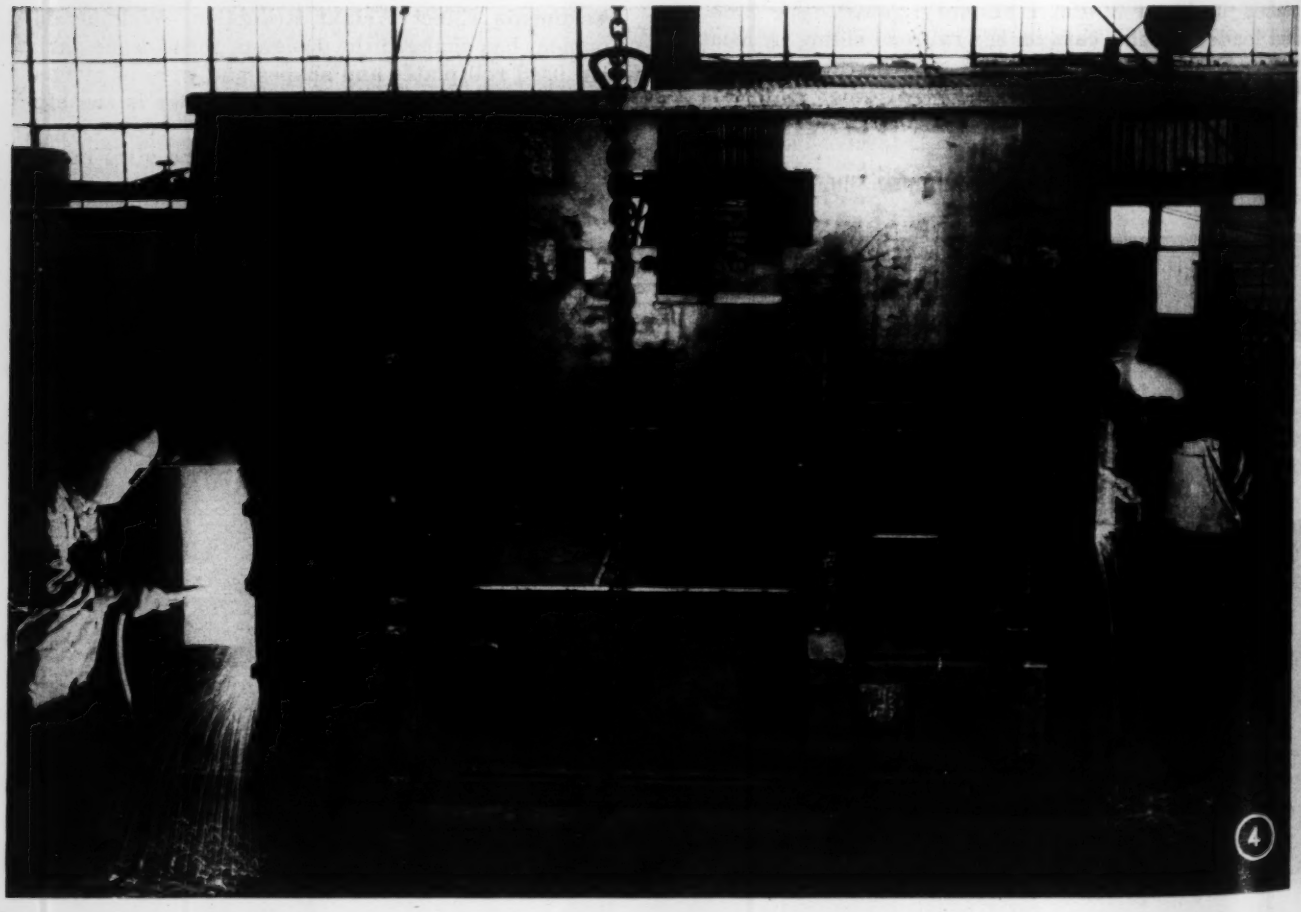
Press Brake Offers Production Savings—The 500-ton press brake previously mentioned, was recently added to their shop facilities. With this unit weldment design has been further simplified. They are now able to bend ¾-inch plates in lengths up to 10 feet. Thinner plates can be bent in longer lengths, and plates can be fabricated in many different forms which result in savings in ultimate crane cost. This savings is due to a reduction of required fitting and welding time.

One important item of crane construction which has been considerably simplified is the foot walk. By bending up each edge of the foot walk plate, the product is now easier to produce. This walk was previously made of a plate with angles welded along each side with filler bars at the support. The bent-type foot walk is stiffer, better looking, and affords considerable production savings. The brake is used in numerous ways, all of which result in much simpler and functionally better crane construction.

When trolley frames are too large to be shipped by railroad, the structural frame is built up as a three-piece unit. Two side frames in which wheels are mounted combined with a center section, make up the complete frame. Previously side frames were cast with the center section being a riveted structural unit.

Welding as adapted to the fabrication of laminated ladle hooks, has improved their service length. In the past these hooks were made by riveting up plates into the required form. One difficulty experienced was the tendency of the plate to separate at the edge; however, with welding the plate edges around the eye and the bight section of the hook, all such difficulty has been eliminated.

Fig. 4—The manually operated hoist has positioned the trolley frame for welding



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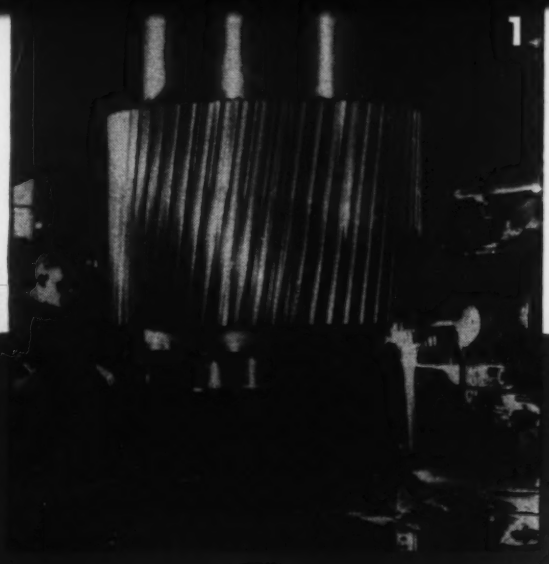

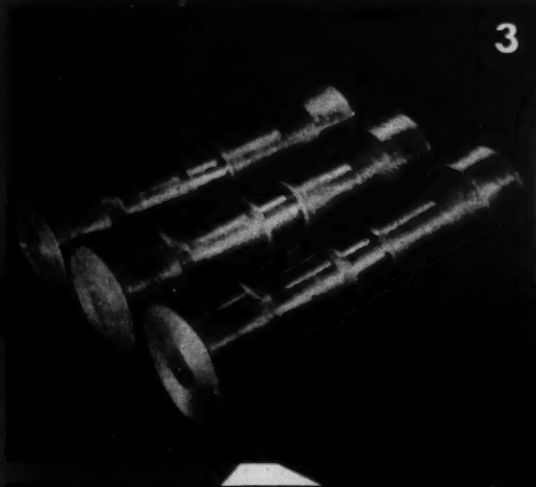

1 Forged steel single helical cut tooth pinion for vertical edging aluminum rolling mill.

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3 Group of semifinished forged steel spindles for four-high continuous strip mill.

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Ferrous and Nonferrous Metals Handled by

MODERATE PRODUCTION SHEAR LINE

BOTH ferrous and nonferrous metal may be flattened and cut to any length from coils at approximately 300 feet per minute by a moderate production shear line developed for use in steel, brass or copper mills, warehouses and fabricating plants. Designed by E. W. Bliss Co., Salem, O., it consists of a coil stop, payoff reel, roller leveller, looping table, upcut shear, gage table and automatic gage unit, oiling unit, pinch rolls and sheet piler.

Simplified upcut shear features a rigid and solid slab one-piece frame, bored to accommodate the self-aligning antifriction bearings for the eccentric shaft. The lower knife head slides on flat bronze ways on the cutting or knife side of the head and is backed up by a 45-degree bronze slide member on each side of the knife head. The company asserts that this arrangement simplifies adjustment for slide wear, as only one adjustment compensates for both side and end wear.

Another advantage is in reduced friction on the lower knife head which is reported to show up in "snappier" shear action. Bliss designed this press for operation through an air clutch with built-in flywheel and integral brake, actuated by a 4-way solenoid valve. Drive is by multiple V-belts from a continuously running motor to flywheel of clutch mechanism and from clutch to shear eccentric shaft, by enclosed helical gears. Stroke of the bottom knife is 4 inches; shear is capable of functioning at a "turnover" speed of 60 cuts per minute.

From a beam located over the gage table is hung the shear gage on rollers. It is manually moved to position for any length of cut and locked in place by wedge clamps and handwheel. Gage consists of a spring-balanced stop bar mounted to sweep away from the end of the strip when being raised, thus preventing damage to the strip's cut end.

Operating through a toggle arrangement by a solenoid coil the gage bar is raised; when in the gaging position it is locked by the toggle action, making it impossible for the strip to move the gage bar to cause a miscut.

A limit switch actuated by a trigger mounted on front face of this gage bar trips the shear. After the cut is made, the bar is automatically raised by actuating the solenoid coil through another limit switch on the shear's eccentric shaft, allowing the cut sheet to proceed under the gage bar. A second limit switch on the eccentric shaft deactivates the clutch and activates the brake through a solenoid valve, stopping the shear.

Next step in the automatic sequence is the descent of the gage arm by gravity until it reaches the sheet, this being brought about by the deactivation of the shear gage solenoid. A small fiber roller on the bottom of the gage arm prevents scratching. When the end of the sheet is reached, the gage bar drops to its full lowered position, locking the toggle by gravity action. It is then ready for the next cut. Space is provided between sheets for dropping the gage bar by running the shear exit conveyor about 10 per cent faster than the shear entry conveyor.

Another feature seen in the shear line is the hydraulic piler which consists of a platen mounted on two mechanically synchronized hydraulic cylinders. Platen is intermittently lowered as sheets are piled between universally adjustable side and end guides suspended from overhead on antifriction-equipped wheels or rollers and arranged for locking in any selected position.

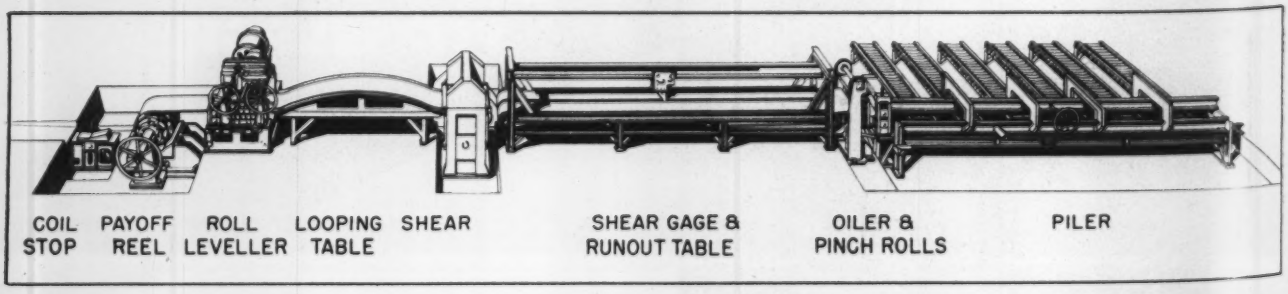
When the pile reaches the desired height, the piler is lowered to its extreme bottom position, allowing the platen to straddle permanently located gravity rollers on which the pile is deposited. It is then automatically discharged under the side guides to storage at the side of the piler.

Power Brush Deburring Saves

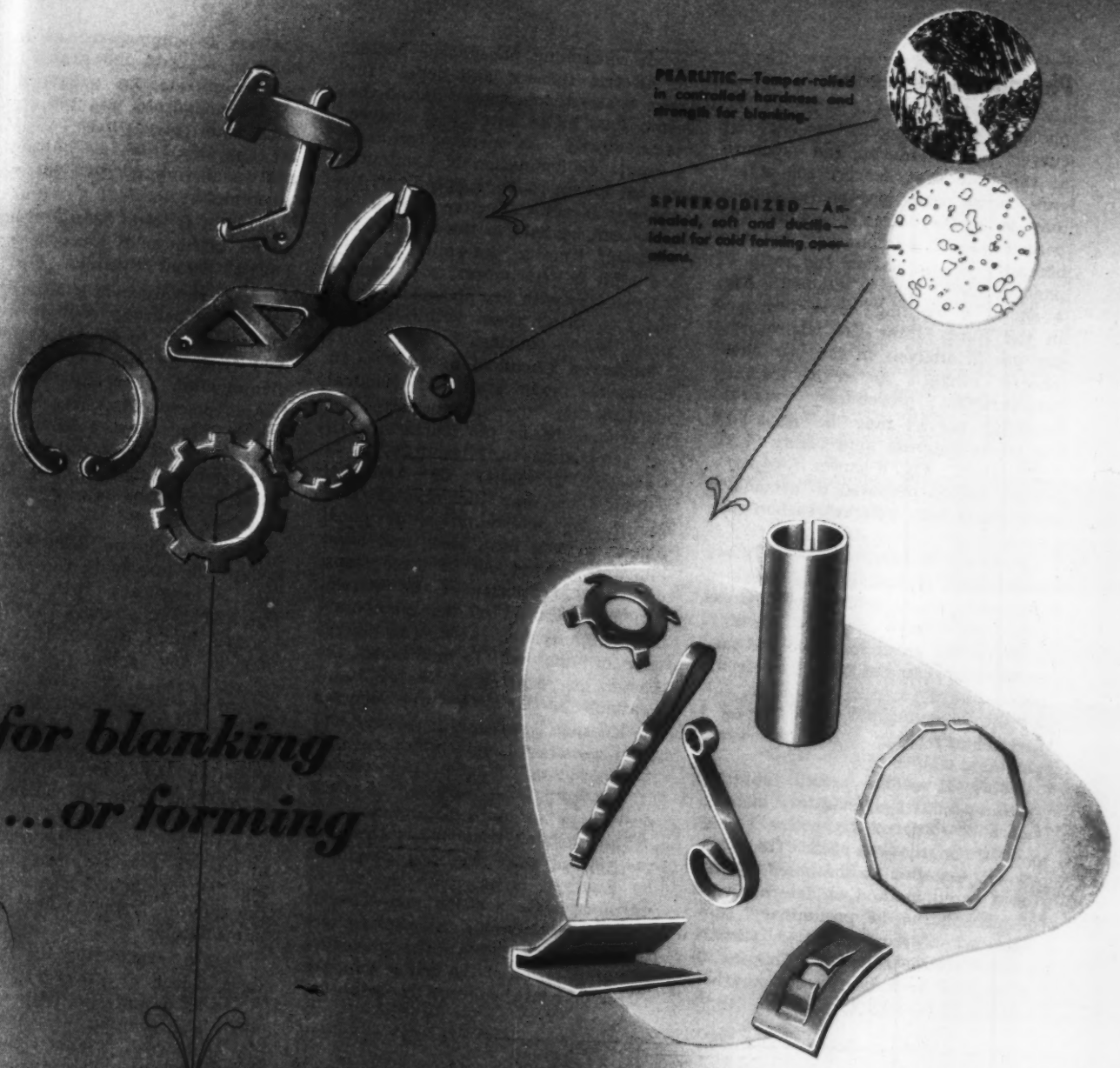
IN ORDER to keep its production line moving, one plant found that it took ten men 12 minutes to finish ten 24-inch steel serrated rods measuring 1 inch in diameter. If there was a slowdown on this one operation, the plant's entire output suffered.

By substituting power brushes for this hand finishing operation on the textile machinery parts, it was found that time required was reduced to 3 minutes per rod and that the services of only 6 men were required, resulting in a savings of four men and 9 minutes plus obtaining a higher quality finish.

Because of the application of the power brushes, made by Osborn Mfg. Co., Cleveland, production was increased down the line, and the production bottleneck that occurred under the hand-brushing operation was eliminated. It is said that the increased output was in addition to the savings of four men, which in a very short time paid for the entire installation. A 15-inch diameter Monitor brush filled to 0.005-inch wire, with a special fixture holding three rods, takes 9 minutes to complete the deburring and finish and radius the serration edges.



Layout of new Bliss 300 fpm shear line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Phosphorus In Steels

(*Continued from Page* 49)

phosphorus to produce a working curve. By terminating the exposure at the time that exactly 100 reference counts occur, phosphorus counts may be plotted directly against the percentage of phosphorus, and the necessity of calculating the ratio of phosphorus to iron is avoided. Fig. 4 shows a working curve prepared in the Ford Motor Co. laboratories for use in analysis in the low phosphorus range. As with ordinary photographic procedures, separate working curves may be necessary for steels differing appreciably in alloy content. Fig. 5 shows Ford laboratory curves prepared to accommodate steels with different carbon contents.

Accuracy Results—Types of alloys tested and typical results obtained using the Geiger counter method, as compared with a standard chemical method, are given in Table I, based on samples obtained from the various production departments at Ford Motor Co. The setup used was an experimental laboratory installation employing a 22 v ac arc.

Table II shows results obtained from a production laboratory installation at Ford Motor Co. where a 2200-v dc arc source was used. The method was installed on the bases of need for a rapid method of determination of phosphorus in preliminary samples taken from electric furnace crankshaft metal heats. This installation has been in use for approximately 10 months serving the foundry in controlling phosphorus content of electric furnace and cupola furnace heats; it has been reported that some 7000 heats have been analyzed satisfactorily. An operator can make a single determination in 2 minutes, or 30 in an hour. Speed of the analysis permits effective control, as heats can be held in the furnace for sufficient time to determine if they are high in phosphorus, and diluted if necessary with low phosphorus material to bring them within specification before pouring.

Improved Chemical Method — In discussing modifications in chemical methods for the determination of phosphorus before the fourth analytical symposium in Pittsburgh, J. L. Kassner, University of Alabama, pointed out that the regular procedure for determination of phosphorus in cast iron, steel, and other alloys is carried out in three steps, namely, (1) solution of the sample; (2) precipitation of the ammonium molybdiphospate; and (3) titration of this salt to determine the amount of phosphorus present. Modifications in the procedure, reported by Kassner, concern the second and third steps in this determination, since it was pointed out that the solution of the samples is effected in each case by a standard procedure.

The modified chemical method for phosphorus determinations, developed by Kassner, is based on the use of citromolybdate solution and separating the ammonium molydiphosphate at the boiling point. The procedure for preparation of the double strength citromolybdate solution used in the analysis is summarized as follows: Solution A—Add 100 grams of ammonium nitrate, 128 grams of citric acid monohydrate, and 136 grams of ammonium molybdate, $[(NH_4)_6 Mo_7O_{24} \cdot 4H_2O]$, to 1400 ml of water, and warm while stirring until solution is complete.

Solution B—Add 528 ml of concentrated nitric acid (specific gravity, 1.42) to 300 ml of water.

The citromolybdate solution is prepared by pouring solution A into solution B. It is cleared as follows: Add 10 to 15 drops of 20 per cent diammonium phosphate solution to the citromolybdate, heat to boiling, and boil for about 5 to 10 minutes; allow the solution to stand overnight; then siphon off the clear solution. (Such a solution is still clear after 2 years.)

Steels Soluble in Nitric Acid—Procedure for dissolving the steel samples is essentially that adopted by the ASTM[9] and others [10, 11]. It was pointed out by Kassner that the volume of acid should be determined by the size of the sample, so that it will not be necessary to use more than 8 ml of concentrated ammonium hydroxide (specific gravity, 0.90) in adjusting the acidity. The volume of solution after the acidity is adjusted should not be over 100 ml. Add 100 ml of double-strength citromolybdate solution, heat to boiling and boil for about 5 minutes. Remove the solution from the heat and filter immediately.

Before transferring the precipitate to a Gooch crucible, wash it three times by decantation with 1 per cent nitric acid solution, using about 5 ml for each wash. Transfer the precipitate to the crucible and wash it 10 to 12 times with 1 per cent potassium nitrate solution. Place the crucible in the original beaker and dissolve the precipitate in a known volume of 0.1 N sodium hydroxide solution using about 30 ml to 45 ml excess. Add ½ ml of the mixed indicator prepared according to the procedure given below[12] and titrate the solution with 0.1 N nitric acid until it turns yellow. Remove the crucible from the beaker, wash with carbon dioxide-free water, and adjust the volume to about 100 ml. In direct sunlight or in front of an illuminator equipped with a fluorescent daylight Mazda lamp, back titrate the solution with 0.1 N sodium hydroxide until a purple coloration appears and remains. The percentage of phosphorus is calculated on the basis of one phosphorus is equivalent to 23 NaOH equivalent. Data obtained with typical samples are tabulated in Table III.

The mixed indicator developed by

NO ATOMIC PROJECTILE: This 600-pound live center, built by Ready Tool Co. of Bridgeport, Conn., is for incorporation in a special heavy duty lathe carrying a 200,000 pound turbine rotor shaft. Center has seven sets of bearings and shock absorbing mechanism. Outside is of heat treated chrome nickel steel, while spindle is 18-4-1 high speed steel for greater wear resistance. Ball bearing assemblies are shrunk on and "locked in" for accuracy in alignment

Kassner for use in phosphorus determinations is prepared by the following procedures: Prepare phenol red and bromothymol blue solutions by triturating 0.1000-gram of each of the indicators in an agate mortar with an excess of sodium hydroxide. When the indicator has dissolved completely, adjust the pH with nitric acid to 7.5 and dilute the solution to 250 ml in a volumetric flask. The mixed indicator is prepared by mixing 40 ml of the bromothymol blue solution with 25 ml of the phenol red solution.

Steels Insoluble in Nitric Acid—Weigh out a 0.5 gram to 2 gram sample of the steel into a 400-ml beaker; add 30 ml of hydrochloric-nitric acid[10] mixture; add 0.5-1.0 ml of hydrofluoric acid. It is best to mix the acids in the proportion of 1 HCl to 2 HNO_3 several hours before using. Heat on hot plate until the sample is in solution and the silica volatilized[9]; add 30 ml of 60 to 70 per cent perchloric acid, and evaporate to fumes of perchloric acid and fume for 5 to 10 minutes. Cool, add 50 ml of water and a saturated solution of sulphur dioxide or sodium sulphite until chromium and vanadium are reduced, and boil until all of the sulphur dioxide has been expelled. The volume at this point should not be over 80 to 100 ml. Add 100 ml of double-strength citromolybdate solution, heat to boiling, and boil for 10 to 15 minutes. Remove the solution from the heat and filter.

From this point on, according to Kassner, the procedure is the same as for steels soluble in nitric acid. Typical data obtained are given in Table IV. In determining phosphorus in cast iron the samples are dissolved according to standard procedure, precipitated, and titrated as described for phosphorus in steel.

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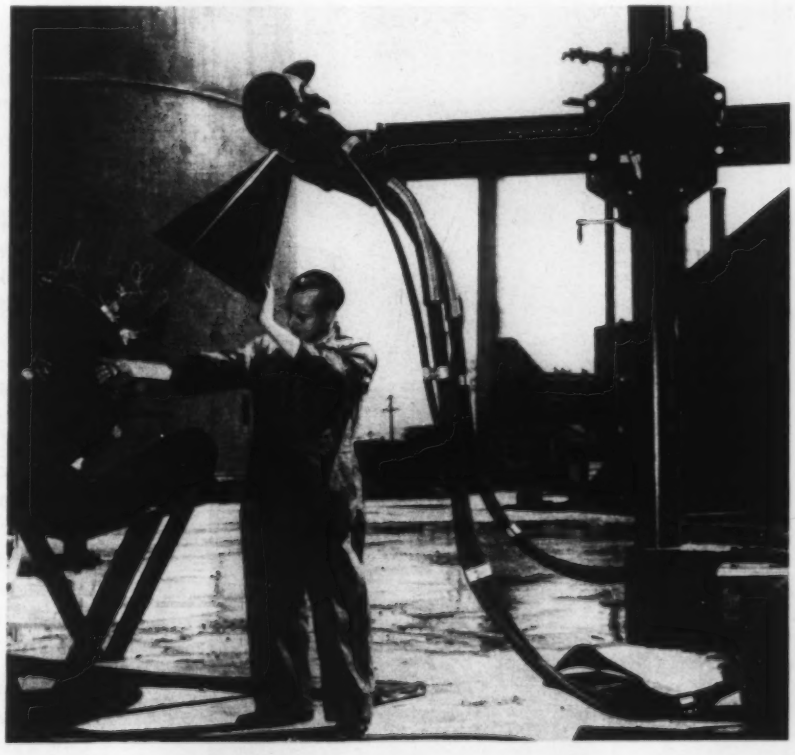
Technician positioning tubehead of a Westinghouse 250,000-v industrial mobile x-ray unit for radiographing a flange weld on a pressure tank



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Technical and Research Director
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Production of

Steel Castings

Beginning with a few tons during Civil War days, production of steel castings has increased until today's normal peacetime output is considered to be approximately a million tons. In 1943, at the peak of World War II production, approximately 2,700,000 tons were produced

PART I

STEEL CASTINGS are any cast steel objects that do not require further mechanical working. Cast steel may be defined as steel that is poured into and allowed to solidify in metal or refractory molds. It should be pointed out, however, at the outset that most all commercial steel castings are produced in refractory molds.

The five classes of commercial steel castings are as follows: 1—Low-carbon steel castings (carbon content below 0.20 per cent); 2—medium-carbon steel castings (carbon content between 0.20 and 0.50 per cent); 3—high-carbon steel castings (carbon content between 0.50 and 1.70 per cent); 4—low-alloy steel castings (alloy content totaling less than 8 per cent); and 5—high-alloy steel castings (alloy content totaling more than 8 per cent).[1]

Carbon steel castings are considered as containing less than 1.70 per cent carbon along with other elements normally present in steel castings. These elements vary somewhat, but are usually present in the following ranges: Manganese 0.50 to 1.00 per cent, silicon 0.25 to 0.85 per cent, phosphorus 0.05 per cent maximum, and sulphur 0.06 per cent maximum. In addition, carbon steel castings contain small percentages of other residual elements, which are not added but tend to vary over a period of years in the melting charge of all steel products.

The medium carbon class represents the bulk of the steel casting output and constitutes the "regular grade" product.

Alloy steel castings contain aluminum, chromium, cobalt, copper, manganese, molybdenum, nickel, selenium, silicon, titanium, tungsten or vanadium, which are intentionally added, or are present in residual amounts, and produce improved properties over those found for carbon steel castings. "High-alloy" steel castings includes the heat and corrosion-resistant cast steels in addition to the austenitic manganese cast steels.

Beginning with a few tons in Civil War days, production of steel castings increased, until in 1900 the industry was producing about 200,000 tons yearly. During World War I production rose to about 1,500,000 tons. In 1943, at the high peak of World War II production, approximately 2,700,000 tons of steel castings were produced. Normal peacetime production is considered to be about one million tons.

Steel castings go into all the heavy industry products, such as railroad, automotive and shipbuilding industries; machinery and tools; rolling mill industries and road and building construction industries. Steel castings are used in quantities in material handling

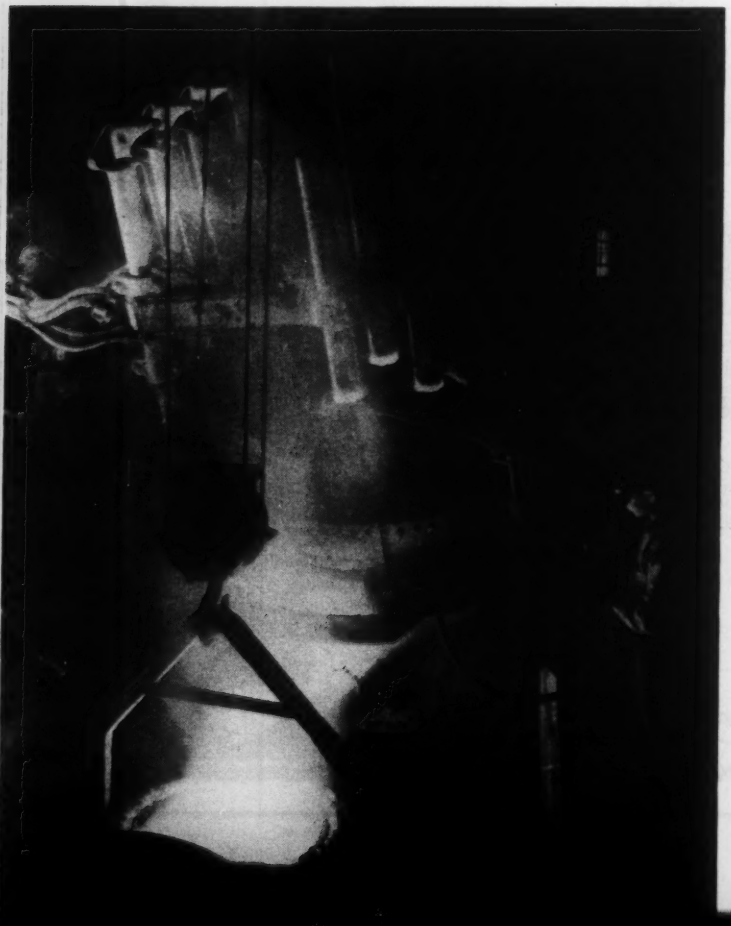

Fig. 1—Tapping a small electric arc melting furnace

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equipment, power plants, oil field and refining industries, mining and chemical industries, and many others.

Records indicate that steel castings were first produced commercially about 1850. The Bochumer Verin produced church bells of cast steel in 1851. These were displayed at various international expositions throughout Europe, and one of the first bells is on exhibit at Bochum, Germany, near Essen.

Steel for these early castings was made in crucible furnaces and poured into metal molds.

The first steel castings were produced in the United States about 1860, about the time of the Civil War. The records lead to the conclusion that these first castings were for railroad applications.

Castings were first made with open hearth steel about 1875, and with converter steel about 1881, though not much success was attained until the side blown converter was used as a melting unit in 1899.

The first electric furnace steel for commercial castings in the United States was poured in 1915 and high frequency electric induction furnaces to melt alloy steel for commercial castings did not take place until 1930.

Along with the development of melting furnaces used in producing steel for castings, similar progress in the improvement of molding and other foundry processes and equipment was steadily being made. Earliest molds were made of ground firebrick and fire clay. Later, they were made of silica sand bonded with glue, water and molasses.

In the early days all molds were dried in ovens. Use of green, or undried sand molds dates from 1891. The first molding machines appeared about 1870 and were hand and mechanically operated; however, it was not until about 1890 that they were operated with compressed air. At the turn of the century there was no electric or gas welding used in the foundry; heat treatment was still relatively primitive; cutting-off torches were unknown, and pressure blasting equipment had not yet been devised.

Contrasting the facilities, equipment and product of a modern steel foundry with those of the best

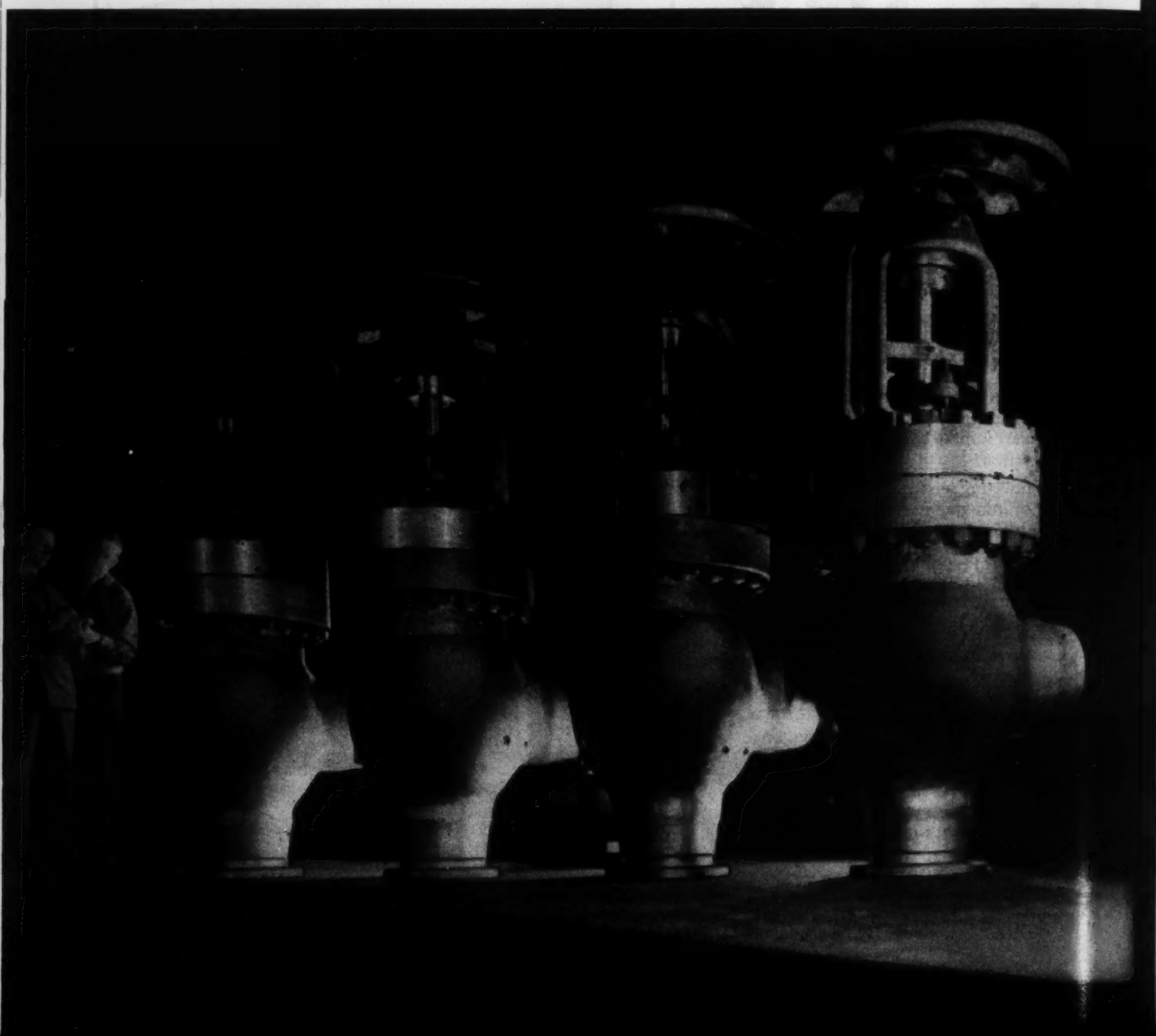

Fig. 2—Cast steel valve bodies that are used for power plant equipment

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Fig. 3—Pattern equipment and core boxes required to produce an intricate pump casting

foundry of 20 years ago is like comparing the modern streamlined motorcar with the creditable but primitive horseless carriages. Today steel foundries are mechanized in all departments and considerable study is given to new developments in mechanization of processes.

Steel foundries range in size from those capable of producing several thousand tons of steel castings a month to those which produce less than a hundred tons a month. Many foundries, such as those which produce railroad specialties, are highly mechanized. Jobbing foundries, on the other hand, have production schemes which are quite flexible and easily adapted to the production of their variable product.

Each plant is individual; therefore, it would be impractical to explain in detail the process of manufacture of all plants, or, for that matter, the actual methods of any one foundry. It is planned to describe those general manufacturing methods that are common to all steel foundries. In this way modifications and variations in practice can be touched upon to illustrate the diversity existing in the production of steel castings.

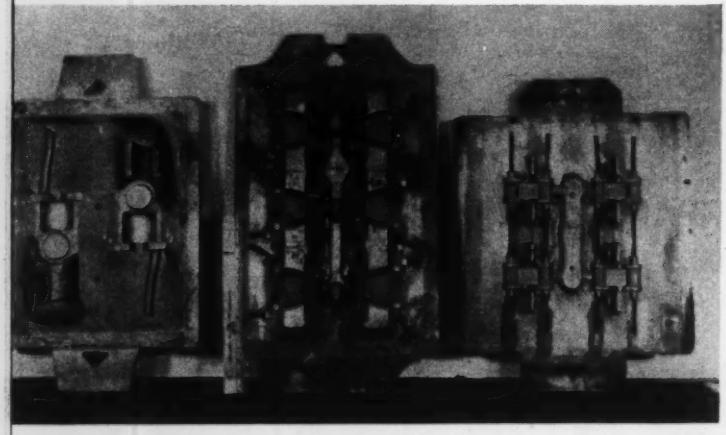
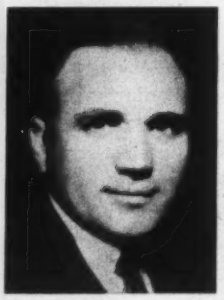


Fig. 4—Metal match-plate patterns



Charles Willers Briggs received his formal education at Stanford University, after which he became research metallurgist for the Standard Oil Co. of California. He left this position to become a member of the staff of the Naval Research Laboratory, Washington, D. C., where he remained eight years, advancing through different positions to senior physical metallurgist. He was in charge of the Steel Casting Research Section, and was the Navy's consultant on steelmaking, steel castings, and non-destructive testing.

In 1938 he accepted the new position of technical and research director of the Steel Founders' Society of America, the trade association of the steel casting industry. He is an officer of the society, and directs all of its technical activities.

Mr. Briggs has published numerous technical articles on subjects relating to steel casting production. He is the author of the "Steel Castings Handbook" and "The Metallurgy of Steel Castings" and has an international reputation in the field of steel casting technology. He has received the McFadden Gold Medal of the American Foundrymen's Society, the Mehl Gold Medal of the Non-Destructive Testing Society, and the Electric Furnace Steel Conference statuette award of the American Institute of Mining and Metallurgical Engineers.

He represented the United States government in Germany as a member of the Technical Industrial Intelligence Committee where he studied and reported on techniques developed by the Germans in their steel casting industry.

Mr. Briggs is a member of AIME, ASM, AFS, ASTM, ASME, Society of Naval Engineers, and the Non-Destructive Testing Society.

It should be realized that the method of melting steel, or a particular molding method used by one manufacturer, may or may not be duplicated by another. This difference does not reflect upon product quality but is the result of the nature of the product of each plant. For example, one producer manufactures on a small scale of perhaps only a hundred tons a month, producing miscellaneous jobbing castings. Another manufacturer's output may be several thousand tons, with specialization in the production of a specific line of castings. Type of equipment and methods of processing and materials handling may be entirely different in the two shops, yet castings produced will very likely be required to meet the same inspection and quality tests.

There are several methods by which steel for castings is produced in the United States. These are listed as follows: Open-hearth (acid and basic), electric arc (acid and basic), side-blow converter (acid), and electric induction (acid and basic).

Manufacturing methods used by any one producer depend upon certain general conditions and circumstances. Choice of the steelmaking method to be employed depends upon the organization's policy as to plant capacity or tonnage required, size of the

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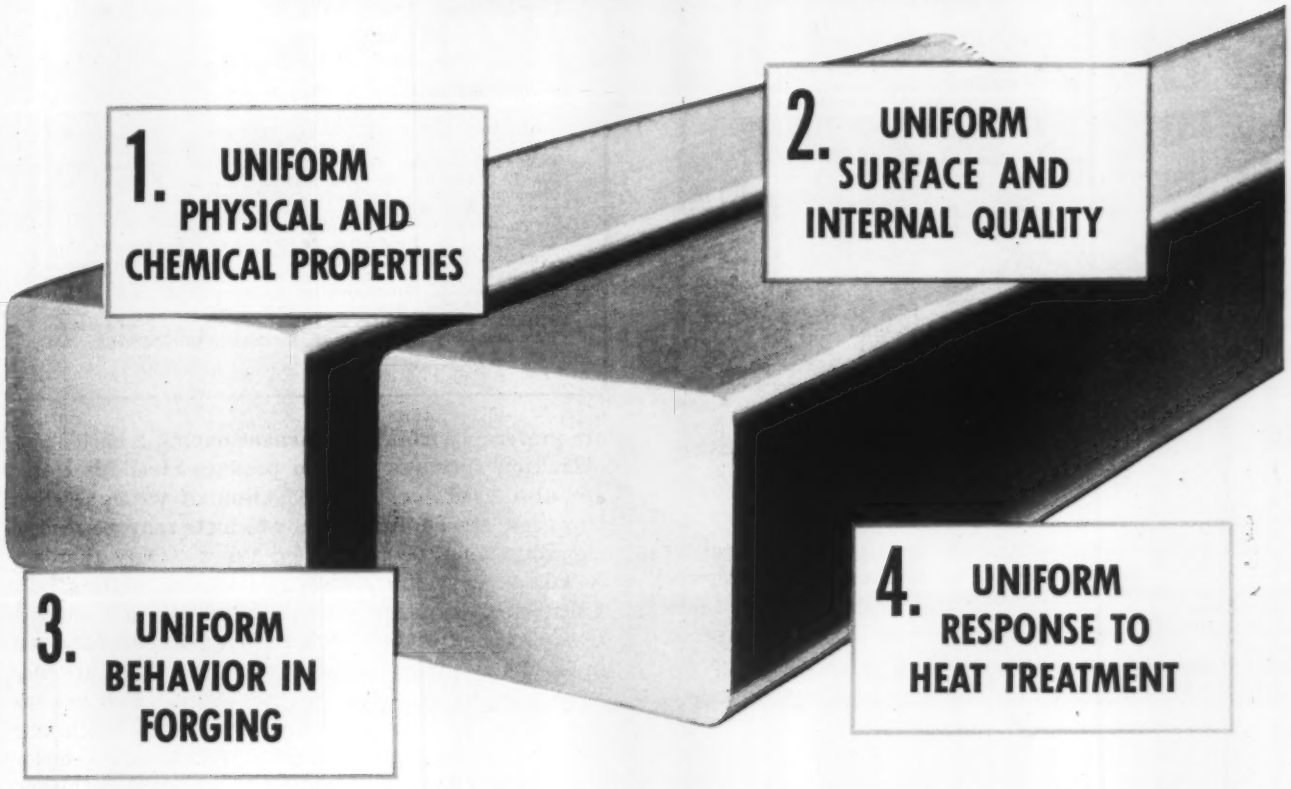
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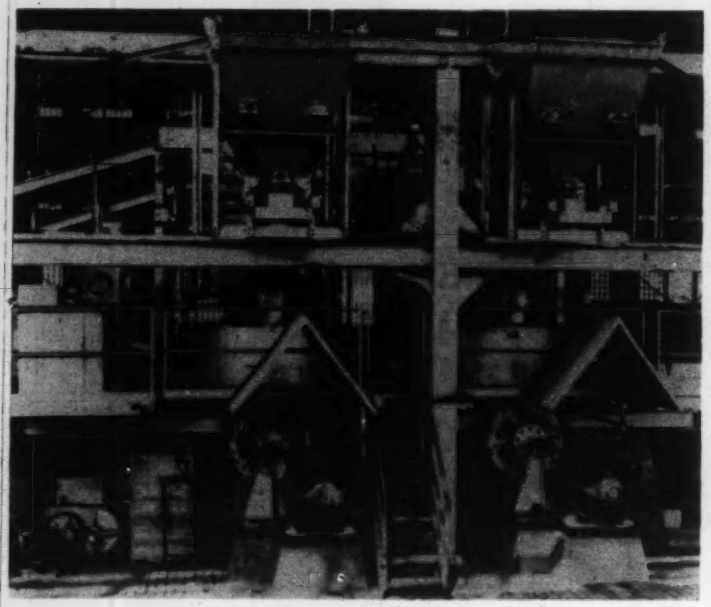

Fig. 5—Sand mulling equipment

castings, intricacy of the castings, type of steel to be produced, raw materials available and prices thereof, fuel or power costs, type of operation desired (acid or basic), amount of capital to be invested, type of labor available, and previous production experience.

If a large tonnage is continually required, the open-hearth furnace is used, whereas a small electric arc furnace is preferred for steels of widely differing analyses, often involving small-lot production. Small quantities of expensive steels of special composition, such as high-alloy steels, are often produced in the high frequency induction furnace. Plants having small floor space and desiring nearly continuous pouring, use the converter.

Foundries which have access to a good grade of scrap, and therefore do not need to eliminate phosphorus and sulphur to meet specifications, in most cases prefer an acid-lined furnace. Other foundries that desire a low phosphorus and sulphur content use basic refractories for furnace lining. Certain types of steel, such as the austenitic-manganese analysis,

Fig. 6—Pouring molds with a bottom-pour ladle

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are preferably made in a furnace having a basic lining.

Melting furnaces used to produce steel for casting are also used for the production of wrought steels. However, steel for wrought products may be made in rimming, semikilled or killed types. Only thoroughly killed (degasified) steel is used for casting. The killed steel used for wrought products may differ as to its method of production from that used for castings, since certain properties of the steel are more important to one than to the other. For example, the steelmaker in a steel foundry is very much interested in the property of fluidity and therefore employs a procedure calculated to produce a steel with excellent running qualities. On the other hand, the producer of wrought steel products is not particularly interested in fluidity, since he is required to fill only ingot molds and not irregular and complicated sand molds. However, the salient features of steelmaking for castings are the same as those employed for dead-killed wrought steel. A detailed description of the various processes as employed in the manufacture of steel for castings is available to the reader if he desires to pursue the matter further.[2]

Pattern equipment for steel castings is similar to that employed for all types of cast metals. Design, intricacy of form, size of the order, and production methods of the foundry making the casting, determine the type of equipment best suited for the manufacture of any particular casting.

Casting purchasers who supply their own pattern equipment are requested to study the foundry's pattern requirements carefully. A knowledge of pattern equipment should be at hand so that a proper selection may be made of the pattern construction, in order that the desired life at the most economical figure may be attained.

Patterns may be classified as follows: Single, loose patterns (wood or metal), gated patterns (wood or metal), metal match-plate patterns, wood, plastic or metal cope and drag patterns, and special pattern equipment.

Single, loose, wood patterns are very reasonably and quickly produced but are used for jobbing work of very limited production. Such patterns are easily warped by moisture and are readily damaged in han-

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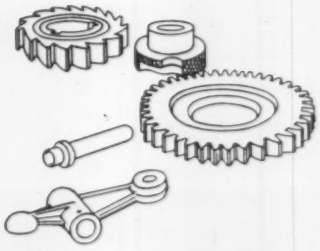

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Fig. 7—Horizontal axis centrifugal casting machine

Fig. 8—Cutting off risers and gates with an oxy-acetylene torch

dling. They are adaptable, especially where an experimental piece of apparatus, under development, is being built and where only one or two castings are required from the pattern. In certain cases, mounted patterns are often more satisfactory as better castings will be produced, at a lower cost, even though the ordered quantities are small. This is particularly true of intricate designs when dimensional accuracy is important. Single, loose, wood patterns are usually the most economical construction for production of large castings.

Loose metal patterns are occasionally used when production is small and an attempt is being made to keep down the cost of pattern construction. Both loose wood and metal patterns have the disadvantage that the time and uncertainty for the molder to cut gates and place risers by hand often exceeds time required for making the mold. This materially affects cost of producing castings with this type of equipment and may cause a variation in casting quality because of varying dimensions of the gates and risers. Mounted wood or plastic patterns on cope and drag boards usually cost little more and are sometimes less expensive than metal patterns, and in addition to providing the added advantage that molding can be performed on molding machines.

Gated wood patterns may be used for small quantity production of simple castings but this type is open to the same general criticisms as are single, loose, wood patterns regarding both warpage and breakage.

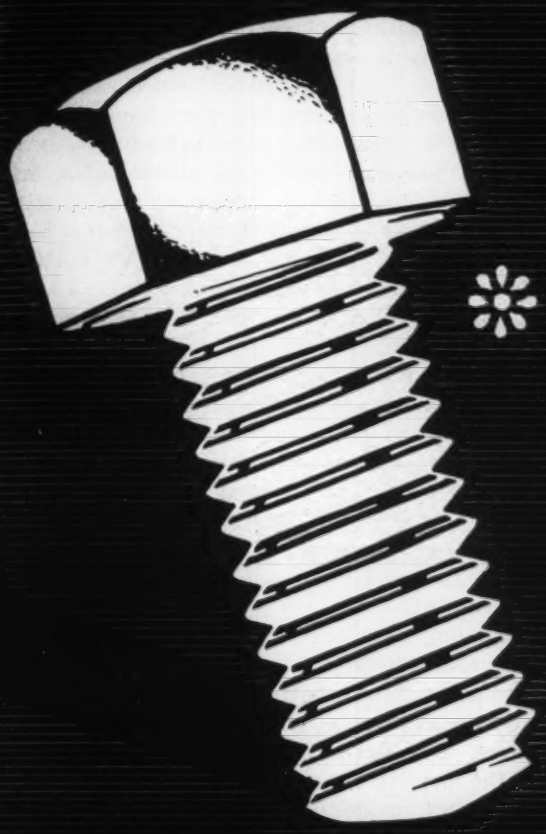
Gated metal patterns are satisfactory for small quantity production. Location of gates and risers on such patterns should be left to the judgment of the foundry producing the castings. It is somewhat doubtful as to whether patterns of this type are justified. It is believed that better results with good wearing qualities may be obtained with mounted wooden patterns.

Metal match-plate patterns for large quantities of small castings assure rapid and accurate production. This type involves a greater initial expenditure but the increased cost is compensated amply by other savings when the pattern cost is spread over a large quantity of production.

Separate cope and drag patterns, made either of wood, plastic or metal, permit good production on small to large castings because one molder or group of molders may ram up the mold drag portion, while another molder or group works on the cope. Metal cope and drag pattern equipment is suited particularly to quantity production and to gang molding on machines. Special pattern equipment such as sweep patterns, skeleton patterns and book molding, find only limited application in steel casting work. The customer should consider them only after consultation with his patternmaker and foundryman.

Shrinkage allowance for patterns is the correction which must be made for the change of dimensions as the solidified casting cools in the mold from the metal's freezing temperature to room temperature. This contraction which takes place is compensated for

Fig. 9—Pouring small steel castings with a two-man shank ladle



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by making the pattern larger by the amount of shrinkage. Patternmaker's shrinkage is reported in fractions of an inch per foot and is 3/16 to 7/64, depending upon the design of the casting. Complicated designs usually take the smaller amount of patternmaker's shrinkage.

Excess metal is provided on all surfaces requiring machining. The necessary allowance, commonly called finish, depends upon: Class of steel, shape of the casting and surface to be machined, size of the casting, pouring position, tendency to warp, machining method and setup and degree of smoothness necessary on the machined surface. Allowances vary from ⅛ to ¾-inch depending on the variables listed above and is incorporated on the pattern during the construction.

Draft is the taper which must be allowed on all vertical faces of a pattern to permit its removal from the sand without tearing the mold walls. Under normal conditions, amount of draft is not less than 1/16-inch per foot.

Making of a mold for a steel casting is the shaping of a suitable material into the desired form so that liquid steel introduced into it will, after solidification, retain the shape predicated by the mold and can be separated from it. It must be strong to sustain the weight of the metal and, at the same time, it must be weak enough to permit the steel casting to contract in normal amount without tearing apart after it has solidified. The mold must resist the cutting action of a rapidly moving stream of intensely hot metal during pouring and it must be made of such material that it will cleanly strip away from the casting after cooling. These requirements narrow the possibilities of a molding material to a bonded granulated refractory, which in most cases is a good grade of silica sand.

Deposits of natural bonded sands, containing from 5 to 15 per cent clay, have in the past been the source of molding materials for steel castings. However, they were subject to large variations and in order for the manufacturer of castings to control his product day by day it was necessary to dispense with their use and to employ synthetic bonded sands.

Synthetic bonded sands are produced by adding to a high-grade silica sand a bonding material, such as high quality bonding clays, e.g., bentonite or fire clays. The sands are usually graded to size classifications, are permeable to gases and have good plastic qualities because of the presence of high grade bonding material. Usually other binders are added, such as cereals of various types, resins, etc., to permit good molding qualities.

In preparation for molding both the sand and the bonding materials are moistened with water. Close control of moisture and binders is of utmost importance as these materals determine the strength and other properties of the sand mixture at room and elevated temperatures. So that this operation may be carried on efficiently, a mulling machine is used, in which the sand, bond and water, are intimately mixed and mulled.

Molding sand coming from the mullers is tested to ascertain whether or not the desired properties are attained. Sand control equipment is standard apparatus and its use is routine in steel foundries. Prepared sand discharged from the mullers is delivered to the molding floor by overhead cranes using buckets, conveyers, monorail hoists, or by lift trucks with bucket attachments. There it is stored in closed hoppers ready for the molder's use.

(To be continued)

REFERENCES

1—*Steel Castings Handbook*—Steel Founders' Society, Cleveland, 1941 edition

2—*Metallurgy of Steel Castings*, Briggs, C. W., McGraw-Hill Book Co., New York, 1946 edition

Aluminum Used in Gas Pipeline

EXTENDING underground for approximately 1.8 miles in Alabama is an aluminum pipe line, said to be the first installed for the transmission of gas in this country. It connects the main trunk line of the Alabama-Tennessee Natural Gas Co. with the Listerhill, Ala., plant of Reynolds Metals Co. Line is designed for a working pressure of 200 psi and a bursting pressure of 1750 psi.

Line consists of extruded type 63S-T6 aluminum alloy pipe, measuring 8⅝ inches OD. Walls are ¼-inch thick. Pipe arrives on the site in 40-foot lengths and is joined by straight butt welds. Ends are prepared for welding by making a 30 degree bevel at the mill, so that no end preparation is necessary on the site.

Weld is made in two passes, using $\frac{3}{16}$-inch diameter 5 per cent silicon type aluminum rod. As the Heliarc method is used, no flux is employed in the welding. This system is said to provide a complete shield of inert gas around the weld zone, protecting the weld and surrounding metal from atmospheric action. A 300 amp portable gasoline driven Hobart Heliarc welder is used and operated at full output.

Entire section of the line, except for a single 40-foot section, is wrapped with cold applied No-Oxid pipe wrap, made by Dearborn Chemical Co. The unwrapped section, bypassed by a wrapped length of pipe, is being left unwrapped to determine if wrapping is necessary. It is planned to dig up the unwrapped section at 6-month intervals for examination.

Installs Salt Spray Test Cabinet

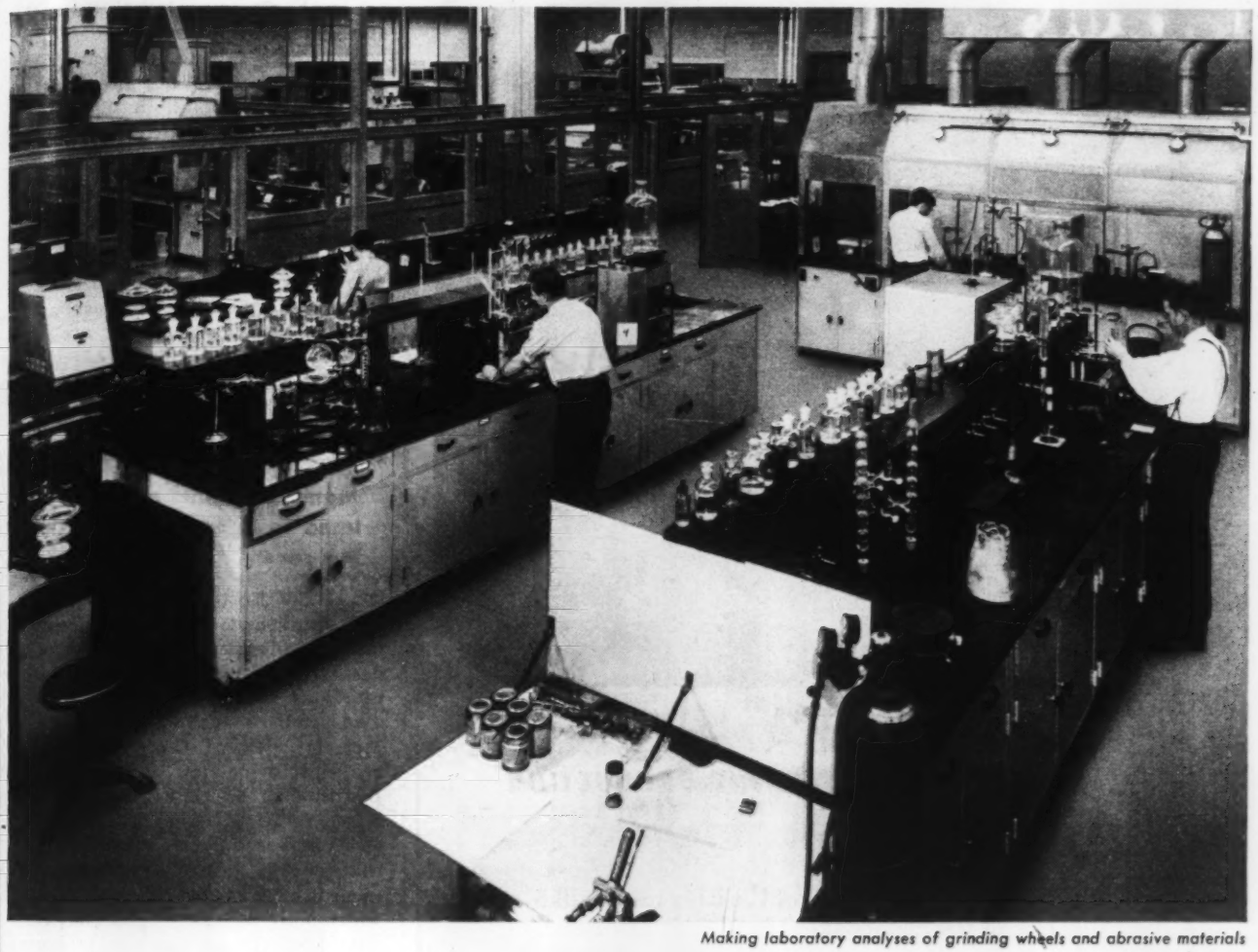
SALT spray testing is used to determine the corrosion resistance qualities of electroplated or coated metal, alloys, metal parts, lacquered or painted samples, etc. A testing cabinet embodying this principle has been installed by United States Testing Co. Inc., Hoboken, N. J., for conducting tests to specifications at controlled temperatures from 70 to 95° F, or higher when specified.

Temperature is accurately controlled by close adjustment of the control switch, which controls air heaters within the salt spray compartment of the cabinet. The heated salt water, when atomized, creates the desired atmosphere within the testing chamber.

Blasting Pellets of Cut Wire

BLASTING pellets made of hard drawn spring wire, SAE 1065 steel, with a Rockwell hardness of 45 to 51 C has shown a useful life of 10 to 15 times that of other types of shot. Surface finishes are said to be cleaner and brighter and equipment maintenance considerably reduced.

According to Pellets Inc., Buffalo, N. Y., wheel blade life is as much as 2000 hours and total shot blasting costs decrease as much as 50



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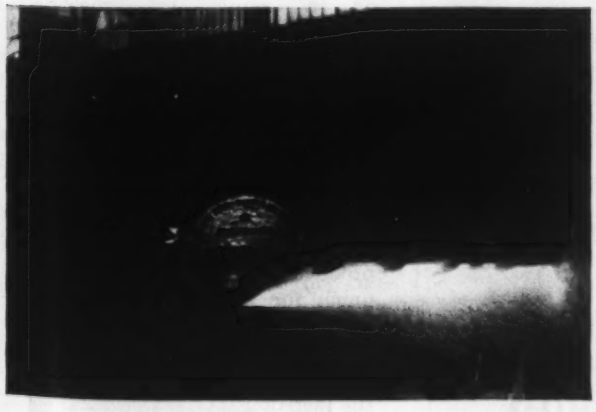

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per cent. It is said that the small steel cut wire cylinders when used become hard, tough ball bearing-like spheres. They do not break up in use and have high uniformity in size and weight which provides an exceptionally high intensity of impact.

It also has been said that pellet-peened parts have shown a fatigued life as much as 50 per cent greater than the same part peened with other materials. Pellets are available in standard sizes that are comparable to the regular SAE standard shot sizes.

Machine Tabulates

Many different quantities related to a process on a single log sheet

QUANTITIES to be measured are selected in sequence, the measurements made, readings transmitted as far as desired and records made in properly tabulated numerical form by a new measuring machine developed by Metrotype Corp., Chicago, and described at a meeting of the American Institute of Electrical Engineers in New York. Machine combines the electronic computer technique with that of the printing telegraph and records data by means of "log sheets" which may be easily read and transmitted, obviating the use of curves and other recording data and saving time and labor.

Useful on Continuous Flow Processes

Instrument is expected to be used on various continuous flow processes, such as steelmaking, electric power, gas transmission, oil refining, etc. Readings of many different quantities related to the process such as time, temperature, pressure, flow, voltage, current, counting, integrated flow, etc., may be assembled in a related manner on a single instrument and on a single log sheet. All readings are taken as scheduled, either by clock contacts or by some element of the process, whether or not the operator is busy with other duties. It is said to be capable of producing up to twenty good carbon copies.

The Metrotype recording was described as a measuring system which produces records in the form of columns for separate quantities, lined up automatically for time or some other factor. The following benefits were said to result from the use of the instrument: Greater accuracy and legibility, uniform timing of readings and each reading distinct from all others.

LETTERS
to the Editors

Who Makes How Much?

Would you please be kind enough to send me a list of the steel manufacturers and their capacities. I am referring to the basic manufacturers such as U. S. Steel, Bethlehem Steel, Jones & Laughlin, etc. For instance, I understand that Bethlehem's output is 13,000,000 tons out of 100,000,000. I am sure that you must have readily available some sort of a list that makes up the 100,000,000.

Leo F. Caproni
Caproni Associates
New Haven, Conn.

The statistics you requested, and many more, are included in "Steel Industry Statistics" in the Nov. 29, 1948, issue of STEEL. A reprint is being sent.—The Editors

Copy for the Governor

Your letter with a tearsheet of my comment on page 236 of your most excellent Metalworking Yearbook is acknowledged with thanks. I have a copy which I am keeping for reference, but I would appreciate it very much if you would send a copy to Hon. Sherman Adams, Governor of New Hampshire, Concord, N. H. I worked with his New Hampshire steel project committee; the contest is not over yet—Portsmouth harbor is a suitable site. I congratulate STEEL on the 1950 Yearbook. The statistical tables are valuable for reference.

Ralph H. Sweetser
R. D. No. 2
Portsmouth, N. H.

From P & E News

In your issue of Dec. 19th, the following appears under Production and Engineering News at a Glance: "PERMANENT GALVANIZING KETTLE—Better zinc coatings are in store for the galvanizing industry. In New York, W. H. Spowers Jr., revealed the issuance of patents covering a permanent galvanizing kettle which will not only give a dross-free life, but may be operated at much higher temperatures than the present standard steel kettle to yield a zinc coat of fine quality. Development is expected to be offered to the industry as soon as satisfactory contacts are made." Will you please give us the address of Mr. Spowers Jr.?

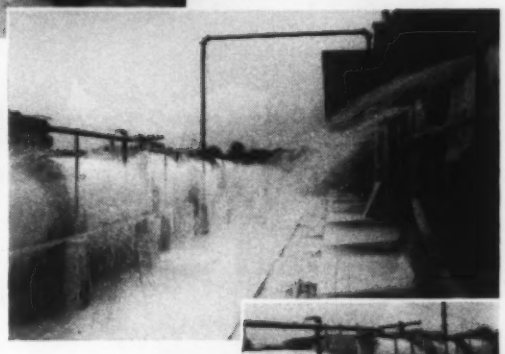
A. E. West
Operating Manager
The Canadian Bridge Co. Ltd.
Walkerville, Ontario

W. H. Spowers Jr., 551 Fifth Ave., New York, N. Y.—The Editors

TOP: General view of the protected area.

CENTER: Foam discharge at the rate of 2 in. per min.

BOTTOM: Area covered by 6 in. of foam blanket in 3 min.



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"Automatic" AER-O-FOAM
PROTECTION FOR INDUSTRY

For many years fire protection engineers have been faced with the problem of finding a feasible answer to the hazard caused by crowded plant facilities where flammable liquids are involved. Conditions of this type exist in many chemical processing industries, metal working plants, petroleum storage and handling and electric power generation properties. A severe hazard was evident at the Schenectady Varnish Company, Schenectady, N. Y., where fire at the tank car loading racks and storage facilities presented a constant threat to the operation of the entire plant.

Having had a background in the development of all types of automatically operated fire protection equipment, "Automatic" Sprinkler engineers designed and installed the mechanical foam system, test photos shown above, and which is now commercially identified as "Automatic" AER-O-FOAM.

The important engineering advantages of this form of protection are evident in the improvement of drainage conditions, reduction of water supply requirements, non-corrosive action of the foam material, positive fire extinguishment and prevention of reflash. As "Automatic" AER-O-FOAM dehydrates rapidly following application, clean-up operations are held to a minimum.

Benzol plants, fuel oil storage and use, oil cellars, dipping, quenching and cleaning tanks and similar major hazards familiar to the metal working industry can now receive positive fire protection through the media of "Automatic" AER-O-FOAM. Your nearest "Automatic" Sprinkler representative will be glad to show you how and—at no obligation to you. Write or call today for descriptive literature.

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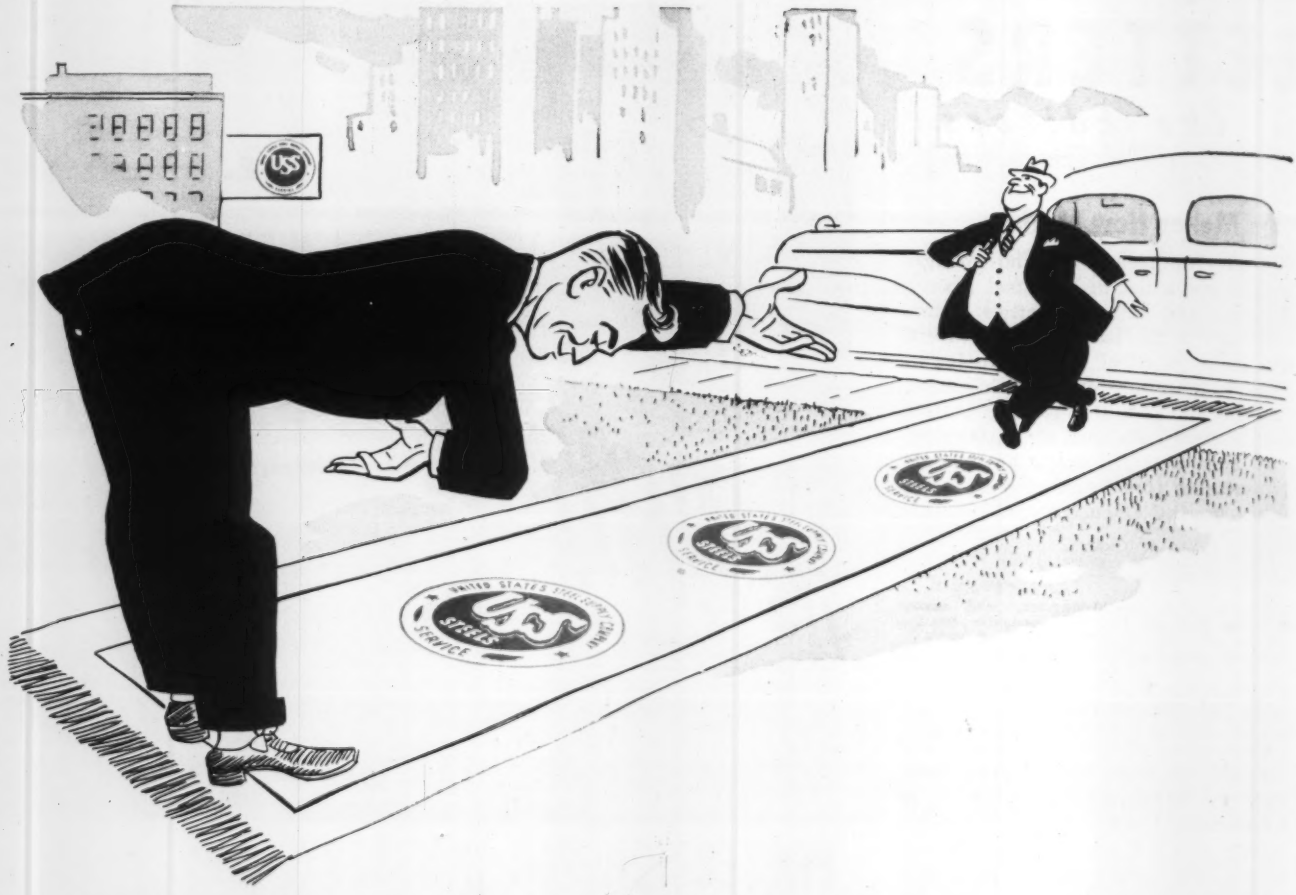

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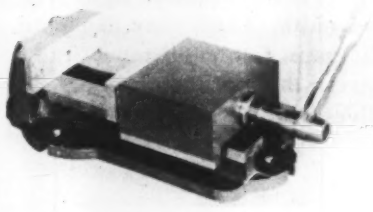
UNITED STATES STEEL

New Products and Equipment

Quick Action Machine Vise

A fractional turn of the wrench grips and releases work instantly in model 8 machine vise for milling machines, drill presses, shapers and vertical boring mills, built by Ames Precision Machine Works, Waltham, Mass. It incorporates a jaw width of 8 inches which opens to full 11-



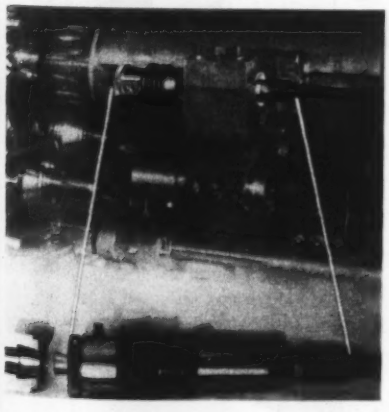
inch capacity. The tilting block and rail saw-teeth engagement principle provides straight jaw gripping power.

Hardened and ground jaws and rails will prevent damage from cutting or drilling operations. Body of vise weighs 85 pounds and sliding block 40 pounds, making it possible for one man to move and set up.

Check No. 1 on Reply Card for more Details

Tool Forms Internally

Back counterboring, thread and grind relieving, back chamfering and ordinary recessing operations may be performed with an internal forming tool for fully automatic machines, designed by Maxwell Co., 570 Broadway, Bedford, O. Series DB tools



are easily and quickly set up and may be used in any position, as well as being interchanged between different machines on which internal forming operations are to be performed.

Provision has been made for accurate adjustment for location and recess diameter. They are available in three standard sizes: A working range from ⅜ to 2 inches, from 1 to 3 inches and from 2 to 4 inches. Additional features include: Ball bearing type pilot located on front of holder for operations involving close concentric and diameter tolerances or when it is desirable to pilot tool into and stop on face of workpiece; standard feed ratio of approximately 1 to 3; and utilization of circular form cutters or cutters with inserted bits, of either high speed steel or carbides.

Check No. 2 on Reply Card for more Details

Preheating, Stress Relieving Unit

Preheating before welding and stress relieving after welding may be preformed with the 40 kva model RTA regulating unit and 40 kva model AC3 low frequency induction heat-

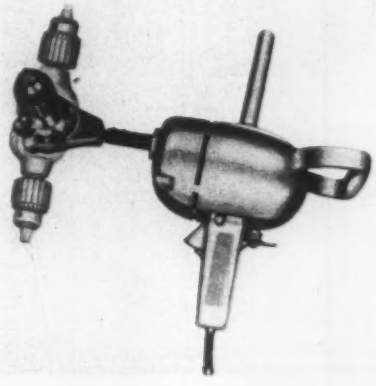
ing unit introduced by Electric Arc Inc., 152 Jelliff Ave., Newark 8, N. J. The RTA regulating unit is for operation on 220/440 and 550 v at commercial frequencies. The heating unit is small enough to be placed near the work.

With models RTA and AC3 more equipment can be added as required; when larger jobs are contemplated the AC3 unit can also be used as a booster unit with the other Smith-Dolan heating equipment, also made by the company. Automatic control cabinets can also be used with the regulating unit.

Check No. 3 on Reply Card for more Details

Drills At Angle

Difficult, hard-to-get-at spots encountered in maintenance, installation, electrical and plumbing work are more easily reached with a 360-degree angle head attachment for ½-inch capacity drills, made by Cummins Portable Tools Division, Cummins Business Machines Corp., 4740 Ravenswood Ave., Chicago 40, Ill. Angle head is quickly removable to convert the tool into a conventional ½-inch drill. Although designed for use with model 200 ½-inch standard duty drill, it will fit any make of ½-inch capacity drill equipped with a

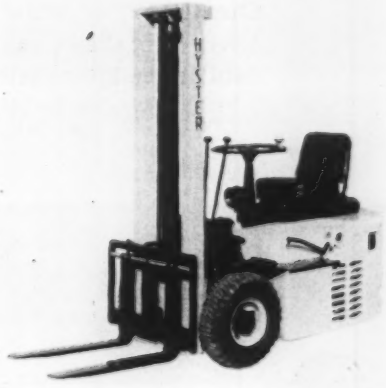


model 33B Jacobs chuck. Head attachment has a strong aluminum housing grooved to cradle in the operator's hand. Gearing has a 2 to 1 ratio. No-load spindle speed on right angle head is 275 rpm when used with the model 200 drill.

Check No. 4 on Reply Card for more Details

Truck Lifts 2000 Pounds

Operating at lower running temperatures because of alterations in both design and engine installation is a 2000-pound capacity model 20 lift truck manufactured by Hyster Co., Portland, Ore. It is powered by a new Wisconsin air-cooled engine capable of withstanding great



extremes in weather conditions. A new clutch provides smoother control and has longer life. A heavier transmission is incorporated in the design.

Uprights are mounted on an extension of the truck frame rather than to the transmission case, and are designed to pivot forward to the

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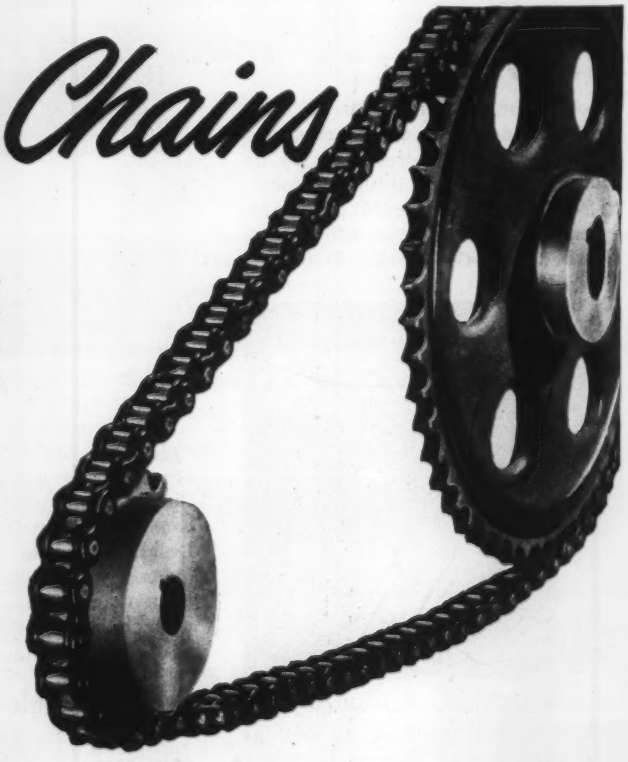
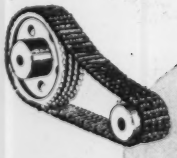


For all the facts on roller chains and how they can help you, see your Baldwin-Rex Distributor or write Baldwin-Duckworth Division of Chain Belt Company, 326 Plainfield Street, Springfield 2, Mass.



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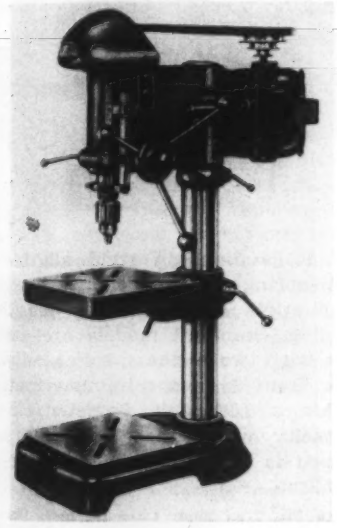
floor to lift the front wheels clear of the ground for changing tires or servicing the power unit. Upright tilt control is accomplished through double-acting hydraulic cylinders. This permits a slower backward tilt, less upright sway and possible pushing of a load with the truck forks. Truck may be equipped with special purpose attachments such as the load-grab, paper-roll grab, scoops, booms, guards, towing hooks, etc.

Check No. 5 on Reply Card for more Details

Drilling and Tapping Presses

Available in high and slow speed models with full-tilting or production oil table, are 15-inch ball bearing drill presses, built by Atlas Press Co., 2395 N. Pitcher St., Kalamazoo, Mich. Models include 15-inch floor-type,



bench-type, production base and two, three and four spindle drills.

Features include a floating drive with six-splined spindle and steel drive sleeve supported by two ball bearings and ground steel spindle supported by two widely-spaced ball bearings. A ground steel quill, a rigid head casting and extra-heavy head, column and base are incorporated. The bench type slow-speed model drills to the center of a 15 inch circle and has nine speeds from 400 to 4400 rpm. The high-speed model has 9 speeds between 580 and 5200 rpm. Both have a spindle travel of 4 inches.

Check No. 6 on Reply Card for more Details

Drills Infinite Patterns

Multiple spindle drilling and tapping unit, developed by Thriftmaster Products Corp., 10 N. Plum St., Lancaster, Pa., is composed of a standard multiple spindle adjustable drillhead and a standard Dorman automatic reverse tapping attachment. Unit at-

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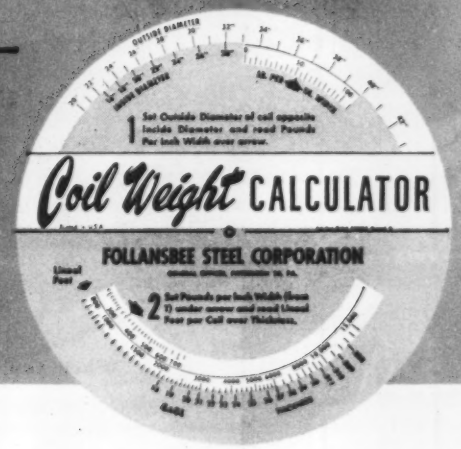

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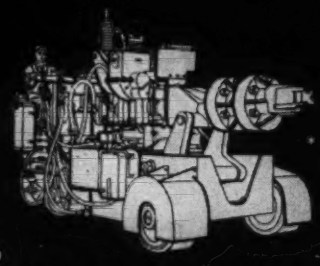
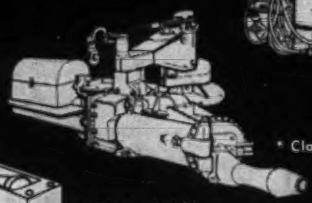
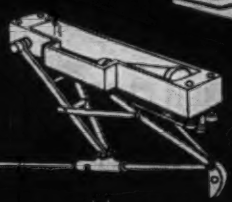


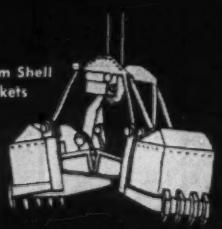
* Chargers and Manipulators



* Clay Guns



* Cinder Notch Stoppers



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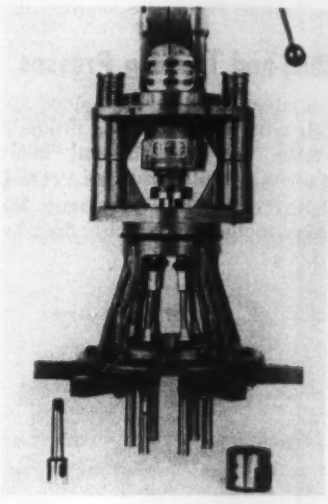
taches to any drill press and will drill or tap an infinite number of patterns. To change the hole pattern, spindle bracket bolts are loosened, spindles are set in desired position and the bolts are locked, holding spindles in the required location.

With taps inserted in chucks, the unit will tap multiple groups of holes on downward stroke, automatically reversing on upward stroke of spindle. Rods maintain rigid alignment and springs counterbalance weight of multiple head, assuring sensitive tapping. Standard models are available with two to ten spindles, adjustable from ½-inch minimum centers within a 10⅜-inch diameter circle. Capacity which may be drilled or tapped is up to ⅜-inch diameter in cast iron.



Check No. 7 on Reply Card for more Details

Truck Removes Mill Bearings

Large rolling mill bearings and pods are removed and replaced in a fraction of the usual time, with a new 2-ton capacity crane truck manufactured by Moto-True Co., 1953 E. 59 St., Cleveland 3, O. Powered by a 12-v battery and drive unit, the truck can pull a bearing in about 1½ minutes.

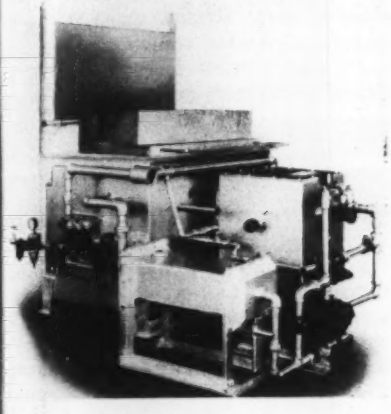
Control is simple. Pushbuttons in the end of handle operate hydraulic raising and lowering mechanism. Two speeds forward and two reverse are controlled by the roller type handle. Truck is furnished in various sizes and specifications.

Check No. 8 on Reply Card for more Details

Vertical Slot Forge Furnace

Protection up to 2400° F against scaling during heating steel for forging or pressing, annealing or brazing ends or sections of bars, band heating, etc., is provided in the lithium

atmosphere vertical slot forge furnace, developed by Lithium Co., 111 Sylvan Ave., Newark 4, N. J. The slight coating imparted to the work presents secondary oxidation to 2200° F during the cooling down period in transferring work from furnace to



forging hammer, press or upsetter or while cooling after hot working.

Integral vaporizing chamber is refractory lined steel shell provided with gas burners or electric heaters. It contains a tubular vaporizer in which a cartridge of lithium compound is vaporized by its own gas or electric heating equipment. Heating is rapid with minimum heat loss through walls. Furnaces are available in single and double slot types. In both types, refractory tiles are adjustable to alter the working opening and slot depth for pieces of varying size or for band heating.

Check No. 9 on Reply Card for more Details

• • •

FLAME-HARDENED JAW WAYS: E. Horton & Son Co., Windsor Locks, Conn., has developed flame-hardened jaw ways in a new line of chucks. Other new features of the S line include hardened and ground replaceable pinion bushings, grease fittings and wider top jaws.

Check No. 10 on Reply Card for more Details

MULTIGRAPH DUPLICATORS: Two new multigraph duplicators, Multilith models 75 and 80, are available from Addressograph-Multigraph Corp., Cleveland 17, O. Both models feature Simflo control, a development which provides for mechanization of many operations that formerly required manual adjustments and supervision.

Check No. 11 on Reply Card for more Details

CONTROL TRANSFORMERS: A line of machine tool control transformers particularly adapted to the inductive, low-power factor loads of

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This product was really planned from all angles! After the mechanical success of the pilot model, using a weldment, the manufacturer figured production costs, sales appeal and qualifications such as durability. Although the weldment served its purpose for experiments, *it didn't answer any of the marketing problems!*

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QUALITY STEEL CASTINGS

Unitcast will welcome the opportunity to provide a "cast steel" answer for your parts problems, too. Our suggestions toward design, *while your product is still on paper*, may save you many dollars in time and future revisions! Write or call today! Unitcast Corporation, Steel Casting Division, Toledo 9, Ohio. *In Canada:* Canadian-Unitcast Steel, Ltd., Sherbrooke, Quebec.

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solenoids, relays and contactors making up machine tool control equipment, is announced by Westinghouse Electric Corp., Pittsburgh 30, Pa. Seven sizes are available for 220/440 v primary to 110 v secondary at 60 cycles. Transformers for 50-cycle operation are available in six sizes and in three sizes for 25-cycle operation.

Check No. 12 on Reply Card for more Details

ALL-PURPOSE COUPLER: Ulrich Mfg. Co., Roanoke, Ill., offers the Ulrix hydraulic coupler for installations where a breakaway type is required or where a standard type is necessary. It can be connected under all operating pressures.

Check No. 13 on Reply Card for more Details

SHUTS OFF MOTOR: Junior model size O cut-out, available from Anchor Steel & Conveyor Co., Dearborn, Mich., shuts off the electric motor instantly when conveyor or machine is overloaded and resets automatically, ready for immediate operation. It will handle capacities from 20 to 150 inch/pounds.

Check No. 14 on Reply Card for more Details

PORTABLE BUCKET PUMP: Model 1808, a new portable, high pressure Centro-Matic bucket pump is introduced by Lincoln Engineering Co., St. Louis Mo., for use with their centralized single line lubrication system. Pump delivers lubricant to circuits of lubricant injectors installed on one or more machines not equipped with a pump or where machines are not grouped.

Check No. 15 on Reply Card for more Details

SAFEGUARD AGAINST ACCIDENTS: To provide protection against the hazard of falling flourescent lamps, Den-El Equipment Co., Hillside, N. J., introduces new safety fluorescent lamp guards. They are made of specially treated resilient steel which makes it possible for them to be sprung aside for relamping and cleaning.

Check No. 16 on Reply Card for more Details

ONE MAN CAR PULLER: Style M electric capstan car puller, made by Silent Hoist & Crane Co., Brooklyn 20, N. Y., has gearing integral with motor. With this unit, one man can pull and spot cars, warp barges, tow truck and trailers, bend pipe, move skid loads, etc., on level up grades or inclines, even around corners and curves.

Check No. 17 on Reply Card for more Details

FOR HANDLING HYDROCARBONS: An improved high pressure seal, designed to meet sealing requirements of equipment handling hydrocarbons under high pressures and temperatures, is introduced by Felt Products Mfg. Co., Chicago 7, Ill. Type H-P seal offers improved control and balance of hydraulic pressures to eliminate excessive sealing face wear; a reduction in number of parts susceptible to wear and a simplified cooling method.

Check No. 18 on Reply Card for more Details

HEATS CHEMICAL SOLUTIONS: For heating chemical and oil solutions, a new thermostatically controlled screw-plug immersion heater is announced by Edwin L. Wiegand Co., Pittsburgh 8, Pa. Built-in thermostat has a temperature range of 60 to 250° F for heating water type solutions, or 200 to 550° F for oil and other viscous compounds. Heaters are rated from 1.5 to 10 kw for 115 and 230 v operation, single or 3-phase.

Check No. 19 on Reply Card for more Details

COMBINATION DRILL TAP: Mohawk Tool Co., Hazel Park, Mich., announces a new tool that drills and taps in one operation. Applications are on through holes only, such as flanges. As drill completes the hole it serves as a pilot for the start of the tap. Tool is available in 16 standard sizes.

Check No. 20 on Reply Card for more Details

INCREASED TAP LIFE: Increased tap life and more precise threads are obtained by the new line of small taps introduced by Woodruff & Stokes, Quincy 69, Mass. They are available in standard or special sizes up to No. 2 (0.086-inch) and have up to 260 threads per inch.

Check No. 21 on Reply Card for more Details

FITTING FOR TUBING: An all aluminum fitting for use with annealed aluminum tubing is introduced by Scovill Mfg. Co., Waterbury, Conn. It is of the Uniflare design which is a self-contained, two-piece fitting, with a self-flaring feature. Fittings are available in all standard shapes on a made-to-order basis for use with aluminum tubing $\frac{1}{16}$ through $\frac{1}{2}$-inch OD.

Check No. 22 on Reply Card for more Details

FORGED STEEL STOP VALVES: Identified as Fig. 444 series, a new line of forged steel stop valves built by Edward Valves Inc., East Chicago, Ind., can be installed in almost any service where small OS&Y steel globe or angle valves are used. Made of carbon or chromium molybedenum steel for two ranges of service conditions, they are rated for 600 pounds at 900° F and 1500 pounds at 850° for steam, oil and gas service.

Check No. 23 on Reply Card for more Det

SAFEGUARDS OPERATORS Jamestown Safety Guard Cor Jamestown, N. Y., offers Anders safety guards made to fit each i dividual press and available f presses with strokes from 1 to inches. Operator controls closing the guard with a foot pedal. Wi guard in closed position, a slidi shaft falls into place locking t guard.

Check No. 24 on Reply Card for more Deta

PROTECTS SURFACES: Kem-Ba a new rust-inhibitive, protective coa ing compound is announced by A Laboratories, Lakewood, O., for pr tecting exterior surfaces exposed atmospheric and corrosive condition Applied by spray, dip or brush met ods, it dries in 20 to 30 minute Coating will not check, peel or crac

Check No. 25 on Reply Card for more Deta

BRINELL TESTING BALLS: Mo consistent hot Brinell hardness tes ing of materials is possible with bal made of Kentanium, a heat resista material, basically titanium carbid developed by Kennametal Inc., La robe, Pa. Balls are precision groun to true sphericity and close toleranc and are available in the standar size of 10 mm.

Check No. 26 on Reply Card for more Detai

GAGE HAS FINE ADJUSTMENT No. 995 universal precision gag made by L. S. Starrett Co., Athol Mass., requires only a quick easy ad justment of the knurled thumb screw to set the exact size required, eithe from a micrometer, height gage, ver nier caliper or gage blocks. A clam nut locks slide securely in place.

Check No. 27 on Reply Card for more Detail

PUMP BELT DRIVEN: Ruthman Machinery Co., Cincinnati 2, O., offer model TLR-1 belt driven gusher pump designed to handle liquids which are difficult to handle and injurious to a conventional type pump. Driving mechanism which incorporates an automatic lubrication system, sup ports both horizontal and vertical shaft which rotates on precision ball bearings.

Check No. 28 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

73. Speed Reducers

Falk Corp.—Bulletin 1110 contains information on parallel shaft, sleeve bearing, speed reducers. Engineering data are condensed into convenient, easily read form.

74. Fork Lift Truck

Hyster Co.—8-page illustrated catalog 1135 is descriptive of redesigned model 20 lift truck with 2000-lb capacity. Chief features are low operating temperature, long-life clutch, double-acting hydraulic tilt control, increased speed, easy steering, automotive-type battery and easy accessibility of parts for servicing.

75. Polishing Lathe

Mitchell Engineering Co.—4-page illustrated form PL 1 describes models 3-VSD, 5-VSD and 7½-VSD polishing lathes with variable speed control from 1500 to 3000 rpm and powered by 3, 5, and 7½-hp motors. Features include two-section split spindle, four-bearing shaft suspension, instant safety action foot brake, all-welded base and Roto-Cone variable speed pulley.

76. Wound-Rotor Motors

Crocker-Wheeler Electric Mfg. Co.—4-page illustrated form BW outlines construction features of wound-rotor motors obtainable in ratings from 1 to 2000 hp. They are available with splashproof and totally-enclosed, nonventilated construction as well as with standard protected-type enclosure. They can be supplied with all standard NEMA mounting assemblies.

77. Alloy Steel Heat Treating

Republic Steel Corp.—56-page illustrated booklet "Heat Treating Republic Alloy Steels" explains various heat treating methods generally used and includes charts showing mechanical properties obtainable in response to tempering at various temperature levels for 21 types of constructional alloy steels.

78. Drills, Bits & Special Tools

Black Drill Co.—20-page illustrated catalog "Hardsteel" with enclosed price list describes tools, dies, drills and tool bits of heat and wear-resistant steel. Available in sizes from ⅛ to 1 in. in increments of 1/64-in., drills will drill, counterbore or countersink any hardened steel without annealing.

79. Stainless Steel

Timken Roller Bearing Co., Steel & Tube Div.—8-page illustrated January 1, 1950 mill stock list gives sizes, finishes and types of stainless steel available for immediate shipment from stock. Bar stock is made in rounds, squares, hexagons and flats.

80. Prefinished Metals

American Nickeloid Co.—Illustrated folder "How to Put a Crimp in High-Cost Production" contains features and applications of prefinished metals. Diagonal, square, diamond and horizontal crimp patterns are depicted. They are available in nickel, chromium, brass, Gold Bond and Tint finishes on zinc, steel, brass, copper or aluminum base.

81. Stainless Steel

Allegheny Ludlum Steel Corp.—36-page illustrated brochure is entitled "Allegheny Metal in Chemical Processing." Applications in acid and chemical, general process, plastics, pharmaceutical, dye and soap-making industries are related. Fabrication, available forms and corrosion resistance of stainless steels are discussed and selector chart given.

82. Cylindrical Grinders

Landis Tool Co.—26-page illustrated catalog 1-49 discusses and contains complete specifications for type CH 12-in. universal hydraulic cylindrical grinders which are particularly suitable for small lot manufacturing, toolroom work and maintenance.

83. Corporation Activities

Union Carbide & Carbon Corp.—32-page illustrated brochure "Products and Processes" depicts principal activities of five major corporation groups: alloys and metals; chemicals; electrodes, carbons and batteries; industrial gases and carbide; and plastics.

84. Pressure Vessels

A. O. Smith Corp.—8-page illustrated bulletin No. V-52 is first of series which will give complete presentation on Multi-Layer pressure vessels. It describes and depicts various steps in manufacture and assembly of vessels built up from concentric layers of thin steel plate, progressively wrapped, tightened and welded together around inner pressure-tight cylinder.

85. Flow Meters

Hagan Corp.—4-page illustrated bulletin M-51 explains how automatic compensation for pressure and temperature variations is achieved in flow measurement of gases, liquids or other fluids with compensated Ring-Balance meters. Built-in integrator automatically totalizes corrected flow.

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HELPFUL LITERATURE

86. Tungsten Carbide

Adamas Carbide Corp.—Letter-size chart entitled "Carbide Manufacturer's Grade Recommendations" indicates proper grades of tungsten carbide for chip removal on steel and nonferrous material ranging from roughing cuts through precision boring.

87. Magnetic Starters

Arrow-Hart & Hegeman Electric Co.—2-page illustrated catalog sheet on sizes No. 2 and 3 type RA magnetic starters presents dimensions, applications and specifications of these units. Maximum horsepower ratings for single and polyphase currents are tabulated also.

88. Shapers

Cincinnati Shaper Co.—32-page illustrated catalog N-5 is guide to line of 25 shapers available in ten sizes and five types. Plain table, universal, utility, high-speed and special shapers are discussed and applications of each depicted.

89. Switchgear Equipment

General Electric Co.—8-page illustrated bulletin GEA-5436 on switchgear equipment for mines covers automatic sectionalizing units for inside-of-mine applications.

90. Double-Stroke Header

Waterbury Farrel Foundry & Machine Co.—14-page illustrated temporary circular No. 102-A-2 presents complete information on Hi-Pro steel solid die double-stroke crank machine capable of making wide variety of upset or cold-headed articles. Machine is well guarded, compact and rigid in design and is provided with automatic lubrication, roller bearings and safety devices.

91. Oil Hardening Tool Steel

Joseph T. Ryerson & Son, Inc.—2-page illustrated leaflet "Ty-Alloy Ground Flat Stock" describes this oil hardening tool steel for dies, jigs, tools and machine parts. Accurately ground within 0.001-in., material can be hardened to over 61 Rockwell C and is available in wide range of sizes.

92. Dry-Type Transformer

Allis-Chalmers Mfg. Co.—8-page illustrated bulletin 61B6382A describes dry type transformer suitable for duty at load center. Built in single-phase sizes of 1½ kva and larger and three-phase sizes of 9 kva and larger, transformer utilizes all-welded steel case, clamp-type connectors and class B insulating materials.

93. Slurry Screens

Buffalo Wire Works Co.—Illustrated leaflet form No. 802 explains advantages of Buffalo square mesh salt filter slurry screens and backing wire for use on vacuum frames and dryers. Mesh is woven from stainless steel wire and then processed for long life and ease of handling.

94. Air Conditioning

Niagara Blower Co.—Illustrated leaflet No. 112 discusses controlled humidity method of providing constant control of air temperature and humidity in both winter and summer. Hygienic Hygrol absorbent liquid is used to remove moisture directly from air with minimum of refrigeration required.

95. Air Compressors

Joy Mfg. Co.—16-page illustrated bulletin A-56 presents Unitair two-stage air cooled compressor which can be equipped with any of three electric drives or with gas or diesel engine. It is supplied in eleven sizes rated from 15 to 125 hp, with piston displacements from 81 to 640 cfm at 125 psi.

96. Carbide-Tipped Tools

Nelco Tool Co.—Illustrated catalog lists and describes various carbide-tipped cutting tools including side, face, shell, end, half-side and fluted end mills; keyseat cutters; masonry drills; and special tools.

97. Grinding Spindles

Pope Machinery Corp.—72-page illustrated catalog No. 57 is designed to help user make quick accurate selection of correct internal grinding spindle for any application. Data are indexed by type of spindle and by make of grinding machine to which it applies.

98. Skimmer Block

National Carbon Co.—Illustrated catalog section M-8703 discusses one-piece skimmer block and enumerates properties of carbon that have made it universally acceptable as construction material where hot metal is encountered.

99. Electrically Heated Rubber

B. F. Goodrich Co.—Illustrated bulletin is presentation of information on embedded wire resistor type of electrically heated rubber. It explains its applications, specifications, fabrications, costs and recommended commercial uses.

100. Chromium Chemicals

Diamond Alkali Co.—32-page handbook on chromium chemicals depicts their general use in more than 17 different industries. Concise data are presented on bichromate of soda, its manufacture and its principal uses including leather tanning, production of dry colors, synthetic dyes and intermediates, and processing of certain synthetic organic chemicals.

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12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

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Market Summary

THREATENED curtailments due to coal shortage are intensifying consumer pressure for finished steel. This is especially true in the light, flat-rolled products. But noticeable rise in demand for wire and related items, bars, structurals and even plates is noted. Some of this enlivened interest stems from fear of short supplies if mills are forced to curtail. One Pittsburgh steelmaker already has effected a 25 per cent cut. Like action by other producers is feared. Blast furnace curtailments are increasing.

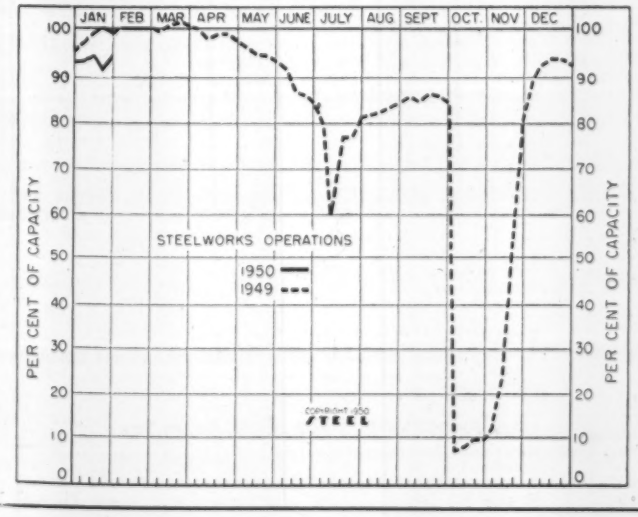
PIG IRON— A few blast furnaces have been blown out or banked because of fuel stringency. Others are being placed on reduced blast which means substantial slowing down in output. Curtailments have been effected by Inland, Republic, Youngstown Sheet & Tube, Crucible and Wheeling. Pig iron production in December, including ferromanganese and spiegel, was 5,230,715 tons. Output this month should show a gain as only 22 stacks were idle at the beginning of the month compared with 35 on Dec. 1. Blast furnace operations in December averaged 87.5 per cent against 76.8 for all of 1949.

OPERATIONS— Steelmaking has been only slightly affected by the coal shortage so far. But early curtailments in open hearths loom. At Buffalo, pending clarification of the outlook, Bethlehem has delayed relighting four of 28 open hearths following settlement of a local railroad strike which closed the Lackawanna plant for four days. Carnegie-Illinois and Inland indicate operations will be reduced in the Chicago district if coal supplies do not improve over the next few weeks. Meanwhile, post rail-strike recovery at Buffalo to 95.5 per cent of ingot capacity, and a rise of 3 points to 106 at Detroit, lifted the estimated national steelmaking rate to 94 per cent from the revised 93 per cent rate the preceding week.

DEMAND— Most sellers are booked solidly for the next five months on major grades of sheets and strip. Only a few openings remain in rolling schedules. Consumers are pressing to get tonnage on books for third quarter but producers are declining such offers. Strike shutdown of Chrysler Corp. plants is being watched by buyers as possibly resulting in shipment deferments which would make additional flat-rolled tonnage available for the general market. Wire business is definitely stronger, especially on farm demand. Plates are moving a little more actively in the Midwest. Some structural orders have been placed for second quarter shipment despite spotty fabricating shop activity. Bars are moving somewhat faster though tonnage is still available for first quarter shipment.

PRICES— Advance of 50 cents per ton on Lake Superior iron ore for 1950 is outstanding pricewise. This puts ore at 56.6 per cent above the 1939 level. Whether the rise will be reflected in pig iron is uncertain. Except for an advance of $3 on southern grades by Republic Steel Corp. pig iron has held unchanged in the recent industry price adjustments. Isolated advances continue on the various finished products but the upward movement now is about completed. Wrought iron pipe has been raised $4 to $12 per ton and nonintegrated producers are reported considering a $5 increase on cold-rolled strip. Some of them now are quoting $7 per ton above the general market.

COMPOSITES— STEEL's weighted index on finished steel held last week at 156.13 and compared with 155.05 a year ago. Arithmetical price composites also are unchanged and compare with the like week in 1949 as follows: Finished steel, $93 and $97.77; No. 2 foundry pig iron, $46.22 and $46.63; basic pig iron, $45.72 and $46.22; malleable pig iron, $47.27 and $47.34; steelmaking scrap, $26.83 and $40.33.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Jan. 28	Change	Same Week 1949	Same Week 1948
Pittsburgh	92.5	— 3*	99	93
Chicago	97.5	+ 1*	98.5	92.5
Eastern Pa.	86	None	97	91
Youngstown	100	— 2	105	103
Wheeling	96	None	86.5	93.5
Cleveland	93.5	—.3*	97	95.5
Buffalo	95.5	+25.5	104	81.5
Birmingham	100	None	100	100
New England	80	None	87	79
Cincinnati	103	None	103	97
St. Louis	87	None	84.5	78
Detroit	106	+ 3	104	92
Western	89	— 1.5	..	..
Estimated national rate	94	+ 1*	99.5	95.5

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.
* Change from revised rate.

News Summary—p. 15 Production-Engineering News—p. 45

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Composite Market Averages

	Jan. 26 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.13	156.13	156.88	155.05	100.32
Index in cents per lb ...	4.230	4.230	4.250	4.200	2.718
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT.....	$93.00	$93.00*	$92.18	$97.77	$57.55
No. 2 Fdry Pig Iron, GT	46.22	46.22	46.10	46.63	23.67
Basic Pig Iron, GT.....	45.72	45.72	45.60	46.22	23.00
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.34	24.29
Steelmaking Scrap, GT..	26.83	26.83	27.25	40.33	19.17

* Revised.

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39; Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Jan. 26 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35–55	2.15
Bars, H.R., Chicago.....	3.45	3.45	3.45	3.35	2.15
Bars, C.F., Pittsburgh	4.10-4.15	4.10-4.15	3.95-4.00	3.95-4.25	2.65
Shapes, Std., Pittsburgh..	3.40	3.40	3.40	3.25–30	2.10
Shapes, Std., Chicago.....	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.40–60	2.20
Plates, Chicago	3.50	3.50	3.50	3.40	2.20
Plates, Coatesville, Pa. ...	3.60	3.60	3.60	3.75	2.20
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.45	2.20
Plates, Claymont, Del. ...	3.60	3.60	3.60	3.95	2.20
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25–30	2.20
Sheets, H.R., Chicago.....	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.00	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.00	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.20	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.65
Strip, H.R., Pittsburgh ...	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pittsburgh....	4.15	4.15	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.30	4.30	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.35-4.40	4.35-4.40	4.20–25	4.20–50	2.90
Wire, Basic, Pittsburgh ...	4.50	4.50	4.50	4.15–4.50	2.60
Nails, Wire, Pittsburgh ...	5.30	5.30	5.30	5.15–6.30	2.80
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.75	$6.70	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$61.00	$61.00	$40.00
Sheet bar, mill (NT)	57.00–58.00	57.00–58.00	51.78–57.00	67.00	34.00
Wire rods, 7/32-⅝", Pitts. .	3.85	3.85	3.85	3.40–4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.30	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.00-46.50	24.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.80	25.84
No. 2 Fdry, Birm. ...	39.38-42.38	39.38-42.38	39.38	43.38	20.38
No. 2 Fdry. (Birm.) del Cin.	46.08	46.08	46.08	49.43	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	46.50	24.00
Charcoal, Lyles, Tenn. ...	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$30.00	$30.00	$30.00	$41.00	$20.00
No. 1 Heavy Melt. E. Pa..	23.00	23.00	23.75	42.00	18.75
No. 1 Heavy Melt. Chicago	27.50	27.50	27.00	39.00	18.75
No. 1 Heavy Melt. Valley..	30.25	30.25	30.25	37.75	20.00
No. 1 Heavy Melt. Cleve..	27.25	27.25	27.25	37.25	19.50
No. 1 Heavy Melt. Buffalo	27.75	27.75	29.75	44.00	19.25
Rails, Rerolling, Chicago..	39.50	39.50	41.50	56.00	22.25
No. 1 Cast, Chicago.....	38.50	38.50	38.50	47.50	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl. ..	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. ..	15.50	15.50	15.50	17.00	7.75
Oven Fdry., Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	18.50	18.50	18.50	23.50	12.00
Zinc, E. St. Louis	9.75	9.75	9.75	17.50	8.25
Lead, St. Louis	11.80	11.80	11.80	21.30–35	6.35
Tin, New York	75.00	75.50	78.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex. ..	28.75	28.75	32.00	38.50	14.50
Nickel, refinery, duty paid.	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark, del	50.63	51.13	51.63	52.13
Brooklyn, N.Y., del.	....	52.79	53.29	....
Birmingham District				
Birmingham R2	41.88	42.38	....	....
Birmingham S9	38.88	39.38	....	....
Woodward, Ala. W15	38.88	39.38	....	....
Cincinnati, del.	....	46.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawada, N.Y. W12	46.00	46.50	47.00	....
N. Tonawanda, N.Y. T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester, N.Y., del.	48.63	49.13	49.63	....
Syracuse, N.Y., del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary, Ind. C3	46.00	....	46.50	....
Indiana Harbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14, Y1	46.00	46.50	46.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie, Pa. I-3	46.00	46.50	46.50	47.00
Everett, Mass. E1	....	50.50	51.00	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
Los Angeles, San Francisco, del	53.70	54.20	....	....
Granite City, Ill. M10	47.90	48.40	48.90	....
St. Louis, del. (incl. tax)	48.65	49.15	49.65	....
Ironton, Utah C11	46.00	46.50	....	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
Neville Island, Pa. P6	46.00	46.50	46.50	47.00
Pitts, N. & S. sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKees Rocks, del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	47.44	47.94	47.94	48.44
Verona, del.	47.90	48.40	48.40	48.90
Brackenridge, del.	48.13	48.63	48.63	49.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	46.00	46.50	46.50	47.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Struthers, O. S16	46.00	....	....	....
Swedeland, Pa. A3	48.00	48.50	49.00	49.50
Philadelphia, del	49.44	49.94	50.44	50.94
Toledo, O. I-3	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard, O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson, O. J1, G2	$57.00
Buffalo H1	60.75

ELECTRIC FURNACE SIVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

Niagara Falls, N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2.	82.00
Wenatchee, Wash., OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$60.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, Intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, Jan. 26, 1950; cents per pound unless otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 ... 51.00

BILLETS, BLOOMS & Slabs Carbon, Rerolling (NT)
Bessemer,Pa. C3 .... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 .58.00
Ensley,Ala. T2 ..... 53.00
Fairfield,Ala. T2 ..... 53.00
Fontana,Cal. K1 ..... 72.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 .... 53.00
Lackawanna,N.Y. B2 .. 53.00
Munhall,Pa. C3 ..... 53.00
Sharon,Pa. S3 ..... 57.00
So.Chicago,Ill. C3 .... 53.00
So.Duquesne,Pa. C3 .. 53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 .... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3 .65.00
Detroit R7 ..... 63.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 ..... 63.00
Fontana,Calif. K1 .... 82.00
Gary,Ind. C3 ..... 66.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 ..... 71.00
Ind.Harbor, Ind. I-2 .. 63.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2 .. 63.00
Munhall,Pa. C3 ..... 66.00
So.Chicago C3 R2 W14 .66.00
So. Duquesne, Pa. C3 .. 66.00
Warren,O. C17 ..... 66.00

Alloy (NT)
Bethlehem,Pa. B2 .... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2 ..... 66.00
Canton,O. T7 ..... 66.00
Conshohocken,Pa. A3 .. 68.00
Detroit R7 ..... 66.00
Fontana,Calif. K1 .... 82.00
Gary,Ind. C3 ..... 66.00
Houston,Tex. S5 ..... 74.00
Johnstown,Pa. B2 .... 66.00
Lackawanna,N.Y. B2.. 66.00
Massillon,O. R2 ..... 66.00
Midland,Pa. C18 .... 66.00
Munhall,Pa. C3 ..... 66.00
Sharon,Pa. S3 ..... 66.00
So.Chicago,Ill. R2 W14.66.00
So.Chicago,Ill. C3 .... 66.00
So.Duquesne,Pa. C3 .. 66.00
Warren,O. C17 ..... 66.00

SHEET BARS (NT)
Mansfield,O. E6 .... $58.00
Sharon,Pa. S3 ..... 57.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Ind.Harbor,Ind. I-2 ... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 .... 76.00

SKELP
Aliquippa,Pa. J5 ..... 3.15
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 ... 3.15

WIRE RODS
AlabamaCity,Ala. R2 .. 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala T2 ..... 3.85
Houston,Tex. S5 ..... 4.25
Ind.Harbor,Ind. Y1 .... 3.85
Johnstown,Pa. B2 .... 3.85
Joliet,Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa,Colo. C10 .... 4.10
Monessen,Pa. P7 ..... 3.85
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 .... 4.50
Portsmouth,O. P12 .... 3.85
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 .... 3.85
SparrowsPoint B2 ..... 3.95
Sterling,Ill.(1) N15 .... 3.85
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 .... 4.65
Worcester,Mass. A7 .... 4.15

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.20
Lackawanna,N.Y. B2 .. 4.20
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 .... 4.20
Weirton,W.Va. W6 .... 4.05

STRUCTURALS
Carbon Steel Stand. Shapes
Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 .... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 .... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston,Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 ... 3.40
Johnstown,Pa. B2 .... 3.45
KansasCity,Mo. S5 .... 4.00
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 .... 3.75
Munhall,Pa. C3 ..... 3.40
Niles,Calif.(22) P1 .... 4.02
Phoenixville,Pa. P4 .... 3.30
Portland,Oreg. O4 ..... 3.90
Seattle B3 ..... 4.05
So.Chicago,Ill. C3, W14.3.40
So.SanFrancisco B3 ... 3.95
Torrance,Calif. C11 .... 4.00
Weirton,W.Va. W6 .... 3.40

Alloy Stand. Shapes
Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05

H.-S. Low-Alloy Stand. Shapes
Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2 .. 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 ..... 5.75
Gary,Ind. C3 ..... 5.15
Ind.Harbor,Ind. I-2, Y1.5.15
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y.(14)B2 5.20
Munhall,Pa. C3 ..... 5.15
So.Chicago,Ill. C3 .... 5.15
Struthers,O. Y1 ..... 5.15

Wide Flange
Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 .... 3.40

H-S., L-A. Wide Flange
Munhall,Pa. C3 ..... 5.10
So.Chicago,Ill., C3 .... 5.10

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 .. 3.50
Bessemer,Ala. T2 ..... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 .... 3.60
Cleveland J5, R2 ..... 3.50
Coatesville,Pa. L7 .... 3.60
Conshohocken,Pa. A3 .. 3.60
Ecorse,Mich. G5 ..... 3.75
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 .... 4.10
Gary,Ind. C3 ..... 3.50
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 .... 3.50
Houston,Tex. S5 ..... 3.90
Ind.Harbor,Ind. I-2, Y1.3.50
Johnstown,Pa. B2 .... 3.50
Lackawanna,N.Y. B2 .. 3.50
Minnequa,Colo. C10 .... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. C3, W14.3.50
SparrowsPoint,Md. B2.. 3.50
Steubenville,O. W10 ... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 .... 3.50
Youngstown C3, Y1 ... 3.50

PLATES (Universal Mill)
Fontana,Calif. K1 ..... 4.40

PLATES, Carbon, A.R.
Fontana,Calif. K1 ..... 5.25

PLATES, Open-Hearth Alloy
Coatesville,Pa. L7 ..... 4.50
Conshohocken,Pa. A3 .. 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago, Ill. C3 .... 4.40
SparrowsPoint,Md. B2.. 4.40

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 .. 4.55
Harrisburg,Pa. C5 .... 4.55
Ind.Harbor,Ind. I-2 ... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 .... 4.55

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 ..... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken,Pa. A3 .. 5.35
Ecorse,Mich. G5 ..... 5.60
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 .... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Houston,Tex. S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1.5.35
Johnstown,Pa. B2 .... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.35
So.Chicago,Ill. C3 .... 5.35
SparrowsPoint,Md. B2.. 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

PLATES, Ingot Iron
Ashland,c.l(15) A10 ... 3.75
Ashland,lcl(15) A10 ... 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.,cl R2 ..... 4.10

PLATES, Wrought Iron
Economy,Pa. B14 ..... 7.85

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 .. 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill.(1) L1 ..... 3.45
Ashland,Ky.(17) A10 .. 3.45
Atlanta,Ga. A11 ..... 3.60
Bessemer,Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryvill,Calif. J7 ... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Marion,O. P11 ..... 3.35
Midland,Pa. C18 ..... 3.45
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 .... 3.85
Niles,Calif. P1 ..... 4.17
N.Tonawanda,N.Y. B11 .3.45
Pittsburg,Calif. C11 ... 4.15
Pittsburgh, J5 ..... 3.45
Portland,Oreg. O4 ..... 4.10
Seattle B3, N14 ..... 4.20
So.Chicago C3, R2, W14.3.45
So.Duquesne,Pa. C3 ... 3.45
S.SanFran.,Cal. B3 .... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 ... 4.15
Weirton,W.Va. W6 .... 3.45
Youngstown C3, R2.... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Niles,Calif. P1 ..... 4.17
Pittsburgh(23) J5 ..... 3.45
Portland,Oreg. O4 ..... 4.10
SanFrancisco S7 ..... 4.00
Weirton,W.Va. W6 .... 3.35

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2 T7..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 ..... 3.95
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .. 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2, W14.3.95
So.Duquesne,Pa. C3 ... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.20
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.40
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 ..... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. I-2, Y1.5.20
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 .. 5.20
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 ... 5.20
Struthers,O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 .... 4.15
BeaverFalls,Pa. M12, R2.4.15
Buffalo B5 ..... 4.15
Camden,N.J. P13 ..... 4.63
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 ..... 4.15
Detroit P17 ..... 4.30
Donora,Pa. A7 ..... 4.15
Ecorse,Mich. G5 ..... 4.30
Elyria,O. W8 ..... 4.15
FranklinPark,Ill. N5 .. 4.15
Gary,Ind. R2 ..... 4.15
Hammond,Ind. L2, M13.4.15
Hartford,Conn. R2 .... 4.55
Harvey,Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 .... 4.55
Massillon,O. R2, R8.... 4.15
Midland,Pa. C18 ..... 4.15
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 .... 4.40
Pittsburgh J5 ..... 4.10
Putnam,Conn. W18 .... 4.55
Readville,Mass. C14 .... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill. W14 .... 4.15
SpringCity,Pa.(5) K3 .. 4.55
Struthers,O. Y1 ..... 4.15
Waukegan,Ill. A7 ..... 4.15
Youngstown F3, Y1.... 4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 ..... 4.90
Ambridge,Pa. W18 .... 4.90
BeaverFalls,Pa. M12 .. 4.90
Bethlehem,Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton,O. R2, T7 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora,Pa. A7 ..... 4.90
Elyria,O. W8 ..... 4.90
Gary,Ind. R2 ..... 4.90
Hammond,Ind. L2, M13.4.90
Hartford,Conn. R2 .... 5.20
Harvey,Ill. B5 ..... 4.90
Lackawanna,N.Y. B2 .. 4.90
Mansfield,Mass. B5 ... 5.20
Massillon,O. R2, R8 ... 4.90
Midland,Pa. C18 ..... 4.90
Monaca,Pa. S17 ..... 4.90
Newark,N.J. W18 ..... 5.20
Plymouth,Mich. P5 .... 5.10
So.Chicago,Ill. R2, W14.4.90
Struthers,O. Y1 ..... 4.90
Waukegan,Ill. A7 ..... 4.90
Warren,O. C17 ..... 4.90
Worcester,Mass. A7 ..... 5.20
Youngstown Y1 ..... 4.90
Youngstown F3 ..... 4.90

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.45
Alton,Ill.(6) L1 ..... 3.45
Atlanta,Ga. A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 ... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Minnequa,Colo. C10 .... 4.25
Niles,Calif. P1 ..... 4.17
Pittsburg,Calif. C11 ... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.10
SandSprings,Okla. S5 .. 4.35
Seattle,Wash. B3, N14.. 4.20
So.Chicago,Ill. R2 ..... 3.45
So.Duquesne,Pa. C3 .... 3.45
So.SanFrancisco B3 ..... 4.25
SparrowsPoint,Md. B2 .. 3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Youngstown C3, R2 .... 3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 .. 4.50
Johnstown, ¼-1" B2 .. 4.35
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.25
Pittsburgh J5 ..... 4.35
Seattle B3, N14 ..... 5.10
So.SanFrancisco B3 .... 5.00
SparrowsPt., ¼-1" B2 .. 4.35
Williamsport,Pa. S19 ... 4.35

RAIL STEEL BARS
ChicagoHts.,Ill.(3) I-2.. 3.30
ChicagoHts.,Ill.(4) I-2.. 3.45
FortWorth,Tex.(26) T4.. 4.33
Hntngtn,W.Va.(3) W7 .. 3.45
Moline,Ill.(3) R2 ..... 3.35
Williamsport(2,3) S19 .. 3.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.9.50
Economy,Pa.(D.R.)B14 11.00
Economy(Stablt) B14. .11.30
McK.Rks.(S.R.) L5 .... 8.60
McK.Rks.(D.R.) L5 ... 11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Hot-Rolled Ingot Iron
Ashland,Ky. A10 ..... 3.70

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.35
Ashland,Ky.(8) A10 ... 3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 .. 3.45
Ecorse,Mich.(8) G5 .... 3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.25
Gary,Ind. C3 ..... 3.35
Ind.Harbor,Ind. I-2, Y1.3.35
Irvin,Pa. C3 ..... 3.35
Lackawanna,N.Y. B2 .. 3.35
Munhall,Pa. C3 ..... 3.35
Niles,O. M4 ..... 3.75
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.35
So.Chicago,Ill. W14 ..... 3.35
SparrowsPoint,Md. B2 .. 3.35
Steubenville,O. W10 ... 3.35
Torrance,Calif. C11 .... 4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 .... 3.35
Youngstown C3, Y1 .... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 .. 4.50
Dover,O. R1 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 4.10
Niles,O. M4 ..... 4.65
Torrance,Calif. C11 .... 5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken,Pa. A3 .. 5.05
Ecorse,Mich. G5 ..... 5.25
Fairfield,Ala. T2 ..... 5.05
Fontana,Calif. K1 ..... 6.74
Gary,Ind. C3 ..... 5.05
Ind.Harbor,Ind. I-2, Y1.5.05
Irvin,Pa. C3 ..... 5.06
Lackawanna,N.Y. B2 .. 5.05
Pittsburgh J5 ..... 5.05
Sharon,Pa. S3 ..... 5.05
So.Chicago,Ill. C3 .... 5.06
SparrowsPoint,Md. B2 .. 5.06
Warren,O. R2 ..... 5.06
Weirton,W.Va. W6 .... 5.05
Youngstown C3, Y1 .... 5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.40
Fontana,Calif. K1 ..... 7.10
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2, Y1.6.20
Irvin,Pa. C3 ..... 6.20
Lackawanna,N.Y. B2 .. 6.20
Pittsburgh J5 ..... 6.20
Sharon,Pa. S3 ..... 6.30
SparrowsPoint,Md. B2 .. 6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 .... 6.20
Youngstown Y1 ..... 6.20

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SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	4.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.15
Dover,O. R1	*4.75*
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Gavannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Culvert, No. 16

	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T-2	5.20	5.45
Gary C3	5.20	5.45
GraniteCity G4	5.40	5.70
IndianaHarbor I-2	5.20	5.45
Irvin C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45

SHEETS, Well Casing

Torrance,Calif. C11	4.85
Youngstown C3	3.85

SHEETS, Drum Body

Pittsburg,Calif. C11	3.95
Torrance,Calif. C11	3.95

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBotm, W.V. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.60
Gary,Ind. C3	6.50
Ind.Harbor I-2	6.50
Irvin,Pa. C3	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Yorkville,O. W10	8.10

SHEETS, Coated Ternes, 12 lb

Yorkville,O. W10	8.95

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.90
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Gran.City,Ill. G4	7.50	7.70
Ind.Harb. I-1, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Conshohecken,Pa. A3	3.35
Detroit M1	3.55
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	3.90
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Carbon

Berea,O. C7	6.10
Bridgeprt,Conn.(10) S15	4.15
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.40
Detroit, D2	4.40
Detroit M1	4.35
Dover,O. G6	4.15
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.15
Fontana,Calif. K1	5.40
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.50
Mattapan,Mass.(21) T6	4.50
Middletown,O. A10	4.15
NewBritain(10) S15	4.15
NewCastle,Pa. B4, E5	4.15
NewHaven,Conn. A7, D2	4.65
NewYork W3	5.00
Pawtucket,R.I.(11) N8	4.70
Pawtucket,R.I.(21) N8	4.65
Riverdale,Ill. A1	4.30
Sharon,Pa.(30) S3	4.15
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	4.65
Wallingford,Conn. W2	4.65
Warren,O.(25) T5	4.15
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown Y1	4.15
Youngstown C8	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y., B2	6.40
Pittsburgh, J5	6.20
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.05

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R. (22 Ga.) Coils (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	6.95	7.45	8.45	9.25
Brackenridge,Pa. A4	...	...	7.45	8.45	9.25
Follansbee,W.Va. F4	...	...	7.45	8.45	9.25
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Vandergrift,Pa. C3	...	6.95	7.45	8.45	9.25
Warren,O. R2	6.65	6.95	7.45	8.45	9.25
Zanesville,O. A10	6.70	7.20	7.45	8.45	9.25

SHEETS, SILICON (24 Ga. Base)

GraniteCity,Ill. G4	...	...	7.15	8.15	...
Mansfield,O. E6	5.90	6.20	6.70	7.95	8.75
Niles,O. M4	5.65	5.95	6.45	...	...
Niles,O. N12	...	6.45	6.95	...	...

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom,W.Va. W10	9.80	10.35	11.05	11.85
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Follansbee,W.Va. F4	9.80	10.35	11.05	11.85
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80
Vandergrift,Pa. C3	12.35	13.60	14.85
Zanesville,O. A10	*13.20*	*14.20*	*14.70*

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.40	8.35	....
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	*4.15*	*5.95*	*6.55*	*8.50*	*10.80*
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	....
Harrison,N.J. C18	...	...	*6.85*	*8.80*	*11.10*
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.65
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	*4.15*	*5.95*	*6.55*	*8.50*	....
NewCastle,Pa. E5	*4.15*	*5.95*	*6.55*	*8.50*	*10.80*
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8:					
Cleve.orPitts.Base (29)	4.55	5.50	6.10	8.05	10.35
Worcester,Base (29)	4.50	5.80	6.40	8.35	10.65
Sharon,Pa. S3	4.15	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.30	6.90	8.85	11.15
Union,N.J. H6	4.40	6.35	6.35	8.30	10.50
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.50	5.80	6.40	8.35	10.65
Youngstown C8	4.50	5.50	6.10	8.05	10.35

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel& Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Clev. Cld.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.
H6 Hind Steel Co. Inc.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
Riverdale,Ill. A1	3.60
Sharon,Pa. S3	3.60
Youngstown C3	3.60

WIRE, Cold-Rolled Flat

Cleveland A7	5.35
Dover,O. G6	5.15
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7	5.35
Pawtucket,R.I.(11) N8	5.70
Pawtucket,R.I.(12) N8	5.65
Trenton,N.J. R5	5.65
Worcester,Mass. A7	5.65
Worcester,Mass. T6	5.30

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.05
Crawfrdsvil,Ind. M8	8.60
Fostoria,O. S1	*8.45*
Johnstown,Pa. B2	7.70
Kokomo,Ind. C16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Trenton,N.J. R5	8.75
Waukegan,Ill. A7	8.05
Worcester,Mass. T6	8.00
Worcester,Mass. A7	8.35

WIRE (16 gage)	An'ld. Galv. Stone	Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdsvil M8	9.95	11.45
Fostoria,O. S1	*9.90*	*11.40*
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	9.40	10.90
Palmer,Mass. W12	9.35	10.85
Pitts.,Cal. C11	9.75	11.25
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland C20	4.15
Cleveland A7	4.50
Crawfrdsvil,Ind. M8	4.65
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	*4.85*
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	*4.45*
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark,6-Sga. I-1	5.15
No.Tonawanda B11	4.90
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. T6	4.45
Worcester,Mass. A7	4.80

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Fostoria,O. S1	*5.90*
Johnstown,Pa. B2	5.90
LosAngeles B3	6.50
Milbury,Mass.(12) N6	6.20
Monessen,Pa. P7	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	5.85
Trenton,N.J. R5	6.20
Waukegan,Ill. A7	5.55
Worcester A7, T6	5.85
Worcester,Mass. J4	6.20
Worcester,Mass. W12	6.20

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	7.50	7.80	8.20
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	*8.05*	*8.05*	*8.30*
Johnstown,Pa. B2	7.50	7.80	8.20
Monessen,Pa. P7	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	7.80	8.10	8.50
Portsmouth,O. P12	8.05	8.05	8.30
SparrowsPoint,Md. B2	7.60	7.90	8.30
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Trenton,N.J. R5	*8.35*	*8.35*	*8.60*
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	7.60	7.90	8.30
Worcester,Mass. J4	8.05	8.05	8.30

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.25	5.70
Bartnville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.15	5.60
Crawfrdvil. M8	5.50	5.75
Donora A7	5.35	5.60
Duluth A7	5.15	5.60
Fairfield T2	5.15	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.15	5.60
KansasCy,Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	*6.30*	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.10	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.15	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	5.75	6.20
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.55	5.60
Torrance,Cal. C11	6.10	...
Worcester A7	5.45	5.90

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.30
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	*6.50*
Monessen P7	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.60
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J., A7, R5	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill.(19) K4	126
Crawfordsville M8	129
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	126

FENCE POSTS

	Col.
Duluth A7	112
Huntington,W.Va. W7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	121
Moline,Ill. R2	116
Williamspt,Pa. S19	*120*

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga.R2	198
AlabamaCity,Ala. R2	116
Aliquip.,Pa.9-14½ga. J5	116
Atlanta A11	116
Bartonville,Ill.(19) K4	116
Crawfordsvil,Ind. M8	119
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.,6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	116

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	116
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
Portsmouth,O.(18) P12	113
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	115
Steling,Ill.(1) N15	113

NAILS & STAPLES, Stock To Dealers & Mfrs. (7)

AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	112
Crawfordsville M8	109
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfrdsvil,Ind. M8	5.50
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown, Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.25
Gary,Ind. C3	5.25
Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25
McKeesRocks,Pa. C3	5.25

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.65
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	8.50
KansasCity,Mo. S5	*9.10*
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	9.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I-2, Y1	5.35
KansasCity,Mo. S5	*5.85*
LosAngeles B3	*5.85*
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.35
Pittsburgh J5	5.60
So.Chicago,Ill. R2	5.35
So.SanFrancisco B3	*5.85*
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.75

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New EngHighCarb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills.
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Corp.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, M14, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 3" 5.15c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.
(25) Up to 0.035 C; 4.40c, 0.035 C and over.
(26) Reinforcing, mill shipments; to consumers, 4.83c; fabricated to fabricators, 4.58c.
(27) 22 Gage; hot or cold-reduced.
(28) Bonderized.
(29) 0.26-0.40 C.
(30) 0.40 C and less.
(31) Not annealed.
(32) untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.

UNIVERSITY OF MICHIGAN LIBRARIES

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	...	8.5	9	...
¼	6.0	0.42	33.5	31.5	...	9.5	11	...
⅜	6.0	0.57	29	27	...	5.5	8	...
½	8.5	0.85	40.5	38.5	39.5	24.0	22.0	23.0
¾	11.5	1.13	43.5	41.5	42.5	28.0	26.0	27.0
1	17.0	1.68	46.0	44.0	45.0	31.0	29.0	30.0
1¼	23.0	2.28	46.5	44.5	45.5	31.5	29.5	30.5
1½	27.5	2.73	47.0	45.0	46.0	32.0	30	31.0
2	37.0	3.68	47.5	45.5	46.5	32.5	30.5	31.5
2½	58.5	5.82	48.0	46.0	47.0	33.0	31.0	32.0
3	76.5	7.62	48.0	46.0	47.0	33.0	31.0	32.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 42% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10. Wheatland, Pa., except 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain N3; Youngstown, plus 26.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	20.5	36.0	20.5
2½	58.5	5.82	39.0	23.5	39.0	23.5
3	76.5	7.62	39.0	23.5	39.0	23.5
3½	92.0	9.20	41.0	25.5	41.0	25.5
4	$1.09	10.89	41.0	25.5	41.0	25.5
5	1.48	14.81	41.0	25.5	41.0	25.5
6	1.92	19.18	41.0	25.5	41.0	25.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2½	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10% Both sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Copper Base Both Sides
302 ...	....	....	....	19.75	21.50–22.50	75.00
304 ...	22.50	26.50	....	20.75	22.50–24.00	77.00
305 ...	....	....	....	....	....	79.00
309 ...	27.00	31.00	....	....	....	....
310 ...	32.50	36.50	....	....	....	105.00
316 ...	27.00	31.00	....	26.00	28.00–32.00	....
317 ...	30.50	34.50	....	....	....	....
318 ...	29.50	33.50	....	....	....	....
321 ...	23.50	27.50	....	23.00	25.00	90.00
347 ...	25.00	29.00	....	24.00	26.00–30.00	94.00
405 ...	18.75	24.75	....	....	....	....
410 ...	18.25	24.25	....	....	....	....
430 ...	18.25	24.25	....	....	....	....
Nickel.	27.50	34.50	31.50 41.00	....	....	88.00
Inconel.	36.00	46.00	....	....	....	115.00
Monel .	29.00	37.00	26.50 33.50	....	....	83.00
Copper*	....	....	19.75† 23.75†	....	....	....

* Deoxidized. † Deduct 4.25c for hot-rolled. Production joints for carbon base products: Stainless plates and sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville, Pa. L7; nickel, inconel and monel-clad plates, Coatesville L7; nickel, monel and copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. plants; per cent off list for less than case lots)

6 in. and shorter:	
½-in. & smaller diam.	27
⅝-in. & ⅞-in.	29
1-in. and larger	26
Longer than 6 in.:	
All diams.	22
Lag bolts, all diams..	
6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage.	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up Bolts	37

NUTS

	Reg.	Heavy
H.P. & C.P. Reg. & Heavy Square:		
½-in. and smaller	25	
⅝-in. & ⅞-in.	23	
1-in.-1½-in.	23	
1⅛ in. and larger	16	
H.P. Hexagon:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	28	25
1-in.-1½-in. ..	25	23
1⅛ in. & larger	17	16
C.P. Hexagon:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	30	27
1-in. & 1½ in..	27	24
1⅛ in. & larger	20	17

SEMIFINISHED NUTS
American Standard
(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.	Lght.
½-in. and smaller	35	41	41
⅝-in. & ⅞-in.	30	36	36
1-in.-1½ in..	27	31	33
1⅛-in. & larger	17	21	..

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in...	50
¾-in. through 1 in...	43
Longer than 6 in.:	
¼-in. through ⅝-in...	33
¾-in. through 1 in....	13

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)

1 in. diam x 6 in and shorter	46
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams...	18

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.25c
7/16-in., under .....43 off

Washers, Wrought

F.o.b. shipping point, to jobbers .....Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.
Imported, net ton, duty paid, metallurgical grade, $39-$40.

STAINLESS STEEL

(cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2.
Baltimore, bars, wire and structurals A10.
Brackenridge,Pa., sheets A4
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.
Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7.
Detroit, strip, except Type 309 M1.
Dunkirk, N. Y., bars, wire A4.
Duquesne, Pa., bars C3.
Gary, Ind., sheets except Type 416 C3.
Harrison, N. J., strip C18.
Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501, 10.50c, Type 502 11.50c R2.
McKeesport, Pa., bars; sheets except Type 416, C3.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars C3.
Pittsburgh, sheets C18.
Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4.
So. Chicago, Ind., bars & structurals C3.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.
Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 58.00c, strip 60.00c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4.
Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 22.00
Toluol, one deg..19.00-24.75
Industrial xylol..20.50-26.50
Per ton bulk, ovens
Sulphate of ammonia..$45.00
Per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots.14.00
Do. tank cars 12.50

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh)

	Cents
Sponge Iron:	
98+% Fe, carlots..	15.00
Swedish, c.l.f. New York, in bags..	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed, 99+% Fe (minus 325 mesh)	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns..	65.00-130.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500-lb drums, freight allowed	30.00
Brass, 10-ton lots.	23.25-26.25
Copper:	
Electrolytic	27.75
Reduced	27.00
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel, unannealed	61.00-66.00
Silicon	34.00-40.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302...	75.00
Tin	90.00-90.75
Zinc, 10-ton lots.	15.50-18.25
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, 1000 lb and over..	2.90
500 to 1000 lb	2.95
less than 500 lb ..	3.05
98.8%, minus 65 mesh, freight allowed. 1000 lb and over..	2.90
less than 1000 lb..	3.05
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.50
less than 200 lb...	2.75
82-88%, freight allowed, 2000 lb and over..	2.40
less than 2000 lb..	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvll.fur...	$13.00-13.50
Connellsvll.fdry..	15.00-16.00
New River, foundry...	18.00
Wise county, foundry	15.35
Wise county, furnace.	14.60

OVEN FOUNDRY COKE

Kearny, N. J., ovens	$22.00
Everett, Mass., ovens New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	21.45
Detroit, del.	23.91
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.32
Cincinnati, del.	22.77
Detroit, del.	23.75
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.02
Cleveland, del.	22.62
Erie, del.	21.04
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.95
Flint, del.	23.00
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.03 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.75	6.84	7.20	6.04	...	5.85	6.64	8.60	5.65	5.90	7.34
New York(c'try)	5.55	6.54	6.90	5.84	...	5.65	6.44	8.40	5.45	5.70	7.14
Boston (city) ..	5.93	6.68	7.44	5.98	...	5.80	6.78	9.07	5.75	6.08	7.28
Boston (c'try) .	5.73	6.48	7.24	5.78	...	5.60	6.58	8.87	5.55	5.88	7.08
Phila. (city) ..	6.45	6.60	6.95	5.90	...	5.75	6.46	8.40	5.50	5.70	6.80
Phila. (c'try) .	6.20	6.35	6.70	5.65	...	5.50	6.21	8.15	5.25	5.45	6.55
Balt. (city) ...	5.25	6.69	6.66	5.79	...	5.69	6.39	...	5.69	5.40	7.04
Balt. (c'try) ..	5.05	6.49	6.46	5.59	...	5.49	6.19	...	5.49	5.20	6.84
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	6.00	...	5.90	6.62	...	5.90	6.10	7.47
Buffalo (del.)..	5.20	5.95	6.94	5.56	...	5.20	5.85	10.43††[5]	5.30	5.60	6.90
Buffalo (w'hse)	5.05	5.80	6.79	5.41	...	5.05	5.65	9.90††[5]	5.15	5.45	6.75
Pitts. (w'hse)..	5.05	5.80*	6.45-6.70	5.20	6.15	5.00	5.75	9.55††	5.05	5.15	6.40
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	6.03	9.86††[5]	5.44	5.59	6.68
Cleveland (del.)	5.25	6.00	7.15	5.44	6.20	5.32	5.95	8.31	5.37	5.52	6.87
Cleve. (w'hse).	5.05	5.80	6.95	5.24	6.00	5.12	5.75	8.16	5.17	5.32	6.67
Cincin. (w'hse).	5.32	5.84	6.29	5.49	...	5.39	6.10	9.90††[5]	5.44	5.59	6.75
Chicago (city)..	5.25	6.00*	6.90	5.30	...	5.20	5.85	9.75††[5]	5.25	5.40	6.60
Chicago (w'hse)	5.05	5.80*	6.70	5.10	...	5.00	5.65	9.55††[5]	5.05	5.20	6.40
Milwaukee(city)	5.39	6.14*	7.04	5.44	...	5.34	6.09	9.89††[5]	5.39	5.54	6.74
Milwau. (c'try).	5.19	5.94*	6.84	5.24	...	5.14	5.89	9.69††[5]	5.19	5.34	6.54
St. Louis(del.).	5.53	6.28	7.18	5.58	...	5.48	6.23	10.03††[5]	5.53	5.68	6.88
St. L. (w'hse).	5.38	6.13	7.03	5.43	...	5.33	6.08	9.88††[5]	5.38	5.53	6.73
Birm'ham (del.)	5.20[10]	5.95	6.30[3]	5.25[10]	...	5.15[10]	6.88	...	5.20[10]	5.35[10]	7.63[10]
Birm'hm(w'hse)	5.05[10]	5.80	6.15[3]	5.10[10]	...	5.00[10]	...	...	5.05[10]	5.20[10]	...
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	6.65	7.90
L. A. (w'hse)..	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
San Francisco..	6.25[9]	8.60[2]	7.50[3]	6.75[9]	8.25[2]	6.15[9]	7.80[8]	...	6.00[9]	6.15[9]	8.10[9]
Seattle-Tacoma.	6.70[7]‡	8.15[3]	...	6.90	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]
Kans. (w'hse)..	5.65	6.40	7.30	5.70	...	5.60	6.35	10.10	5.65	5.80	7.00

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; †† as annealed. Base quantities: 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; [1]—1500 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—300 to 499 lb; [9]—400 to 3999 lb; [10]—500 to 9999 lb inc.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $107; Ottawa, Ill., $106. Hard-fired, $141 and $135, respectively at various points.

High-heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va., Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-$31; single paper bags, $35-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Future increases in upper lake rail freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	*$8.10*
Old range nonbessemer	*7.95*
Mesabi bessemer	*7.85*
Mesabi nonbessemer	*7.70*
High phosphorus	*7.70*

EASTERN LOCAL ORE

Cents per unit, del E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hemitites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-$22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid. 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$35.00
48% 3:1	37.50
48% no ratio	28.50-29.00
South African Transvaal	
44% no ratio	$17.00-18.00
45% no ratio	18.00-18.50
48% no ratio	26.00-27.00
50% no ratio	27.00-27.50
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	28.00-29.00
48% 3:1 lump	37.50
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75%C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese, Electrolytic: Less than 250 lb, max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolitic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 110)

UNIVERSITY OF MICHIGAN LIBRARIES

Tin Declines to 75-Cent Level

RFC reduces tin prices to meet competition of prompt offerings from private importers. Strike closes large copper refinery. Coal shortage held as threat to brass mill operations

New York—Metalworking industry is increasingly concerned about supply outlook for copper and zinc. At the same time, tin supplies are ample with prices still declining.

A strike closed Phelps Dodge Corp.'s Laurel Hill refinery on Jan. 23. This plant, located on Newtown Creek, Queens, N. Y., has a rated capacity of about 150,000 tons of electrolytic copper per year. Several industries located in Connecticut, including large brass mills, have appealed to their congressmen for action to avert a serious stoppage of production work. They have expressed fears over the shortage of soft coal and the resultant interference with production of essential products, particularly zinc.

Copper—Consumption of copper by domestic fabricators declined 338,422 tons to 1,055,885 tons in 1949 from the 1948 total of 1,394,307 tons, reports the Copper Institute. Consumption in December dropped to 86,097 tons from 107,965 in November and compared with 101,716 in December, 1948.

Stocks of copper held by fabricators at the end of the year totaled 352,332 tons, or an increase of 24,529 from stocks on hand at the close of November. Unfilled orders at the close of the year amounted to 189,000 tons, a gain of about 6100 from the end of November. With total stocks and purchases amounting to 149,827 tons at end of December, fabricators had a deficit of 39,173 tons of copper compared with a deficit of 151,060 a year earlier.

Booking of new business in the domestic market is light, due to the well covered position of consumers. Only scattered tonnges must be placed to cover consumers' requirements for Febaruary. Prices are steady on the basis of 18.50c, delivered Connecticut Valley, for electrolytic.

Brass Ingot—Deliveries of brass ingots declined to 175,643 tons in 1949 from 279,500 tons in 1948, 263,711 tons in 1947, and 342,227 tons in 1946, reports the Ingot Brass & Bronze Industry. The 1949 shipments were the smallest reported since 1940. Shipments in December declined to 17,960 tons from 18,488 tons in November and compared with 20,954 tons in December, 1948. The monthly average for 1949 was 14,636 tons compared with 23,292 tons in the preceding year.

Tin—Steady decline in tin prices which has been under way since Sept. 28 continued last week. Tin Sales Corp., selling agency for the Reconstruction Finance Corp., reduced its price ½-cent a pound on Jan. 25 to the basis of 75.00c for Grade A metal. The cut was made to meet competition of prompt delivery offerings from private dealers and importers. The open market had declined to 75.25c on Jan. 23 and subsequently moved to the RFC level. Futures were available at substantial discounts, ranging down to 73.75c for April arrival.

It is unofficially reported Dutch interests have reached an agreement with RFC officials regarding deliveries of tin concentrates and refined metal in 1950. Details of the agreement have not been released.

Indonesia may replace Bolivia this year as the second largest producer of tin in the world, the Commerce Department, Washington, reports. This would mean the United States government's tin smelter at Texas City, Tex., could be operated more economically because Indonesian ore is of higher quality than Bolivian ore. However, purchases from Bolivia will not be allowed to fall below certain levels because the United States wants to keep the avenue to Bolivian sources open in case of an emergency in the Far East. Malaya is the world's largest tin producer.

Lead—Overall demand for lead continues strong, with bookings for January delivery in excess of the December total. Buying has been well diversified with battery makers taking especially large tonnages in preparation for increased production next month. All sellers have not participated in the activity, one reporting only moderate sales. Undertone of the market is steady on the basis of 11.80c, St. Louis, for the common grade.

Zinc—Although brass mills have expressed their anxiety over future supplies of zinc, this has not been translated into large-scale protective buying. As a matter of fact, traders in the market here say that business likely will be retarded so long as the situation in the coal industry remains unsettled. Galvanizers apparently have substantial stocks of zinc and do not want to carry any larger inventories than necessary should they have to curtail due to the fuel shortage. Prime western holds unchanged at 9.75c, East St. Louis.

Foresees Stable Silver Prices

New York—Industrial demand for silver in the United States last year, while below previous postwar years, reflected continuation of high production levels in general, reports Handy & Harman in its 34th annual review of the silver market.

The arts and industries consumed an estimated 90 million ounces, representing decline of 18 per cent from the record 1948.

About two-thirds of the 20 million ounce drop is attributable to sterling and plated silverware. Use of silver in the electrical industry showed little or no decline.

Silver users continued dependent on imports for bulk of requirements. Total imports, both in refined and unrefined form, are estimated at 103.2 million ounces. About 88.8 million ounces, or 96 per cent, originated in the Western Heimsphere, 58.5 million ounces being shipped from Mexico alone, or 57 per cent of the total.

U. S. exports of silver are estimated at 33.4 million ounces. Of this, only about 3.2 million ounces were in the form of bullion, the balance being shipments against foreign coinage orders. Net supplies of new silver available for consumption in the United States amounted to 72.4 million ounces in 1949.

Authorized uses in England during 1949 are estimated to have consumed 11.5 million ounces, off about 2.5 million from 1948. Canadian consumption in the arts and industries registered a gain over the previous year, with total use reported at 5.2 million ounces, up about 15 per cent.

Handy & Harman believe the course of the silver market will be determined by the policies of the Bank of Mexico during 1950. Official stocks in Mexico declined substantially over the last year, in spite of the bank having bought the major portion of Mexico's production, but the principal reason was the important coinage order obtained from the Nationalist government in China. Without this outlet, the bank's market policies would have increased its holdings to the extent of several million ounces by the end of the year. With the Chinese communist regime in virtual control of the entire country, there is no prospect now that important quantities of silver will be bought by China in the near future.

In conclusion, Handy & Harman said: "The Bank of Mexico has indicated willingness to continue its purchases of Mexican production for the immediate future at least. In addition, there are good prospects for a continued high rate of industrial consumption in the country during the first quarter of 1950. In the absence of any knowledge as to what action Congress may take in regard to amending the existing silver purchase laws, we must assume that domestic production will not soon become available to the market. Under these circumstances we believe that the price stability of the past two years will continue."

Insulated Cable Prices Rise

New York—Phelps Dodge Copper Products Corp. has increased its prices of paper insulated cables, effective as of Jan. 24. The quantity discount percentages for its three conductor shielded cables are: 10,000 ft and over, less 35 per cent; 5000 to 9999 ft, less 35 per cent; 2500 to 4999 ft, less 32.5 per cent; 1000 to 2499 ft, less 29 per cent; 500 to 999 ft, less 23 per cent; less than 500 ft, less 14 per cent. The quantity discount percentages for all other cables are: 10,000 ft and over, less 31 per cent; 5000 to 9999 ft, less 30 per cent; 2500 to 4999 ft, less 27.5 per cent; 1000 to 2499 ft, less 25 per cent; 500 to 999 ft, less 19 per cent; less than 500 ft, less 10 per cent.

Based on current prices of copper and lead, the copper factor is now minus 3.00; the lead factor, minus 5.50.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 18.50c, Conn. Valley, Lake, 18.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 16.75-18.25c; 88-10-2 (No. 215) 25.25c; 80-10-10 (No. 305) 21.75c; No. 1 yellow (No. 405) 14.25-16.00c.

Zinc: Prime western 9.75c, brass special 10.00c, intermediate 10.25c, East St. Louis; high grade 10.85c, delivered.

Lead: Common, 11.80c; chemical, 11.90c; corroding, 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.50-17.00c; No. 12 foundry alloy (No. 2 grade) 16.25-16.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00-18.25c; grade 2, 17.50-17.75c; grade 3, 16.00-16.25c; grade 4, 15.50-15.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt delivery, 75.00; February arrival, 74.25c; March arrival, 74.00c; April arrival, 73.75c. Chinese, 99% tin, prompt del., 71.50c.

RFC selling prices for prompt delivery, ex-dock New York or f.o.b. Texas City, Tex.: Grade A, 99.8% or higher (including Straits) 75.00c.

Antimony: American 99-99.8% and over but not meeting specifications below, 28.75c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 29.25c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%: Chinese, 24.00c; English, Belgium, prompt, 25.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $71-$74 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.25c per oz.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 18.50-cent copper.)

Sheet: Copper 32.18; yellow brass 28.69; commercial bronze, 95% 32.10; 90%, 31.61; red brass, 85%, 30.60; 80%, 30.12; best quality, 29.58; nickel silver, 18%, 42.27; phosphor-bronze, grade A, 5% 50.90.

Rods: Copper, hot-rolled 28.03; cold-drawn 29.28; yellow brass free cutting, 23.19; commercial bronze, 95% 31.79; 90% 31.30; red brass 85% 30.29; 80% 29.81.

Seamless Tubing: Copper 32.22; yellow brass 31.70; commercial bronze 90% 34.27; red brass 85% 33.51; 80% 33.03.

Wire: Yellow brass 28.98; commercial bronze, 95% 32.39; 90% 31.90; red brass, 85% 30.89; 80% 30.41; best quality brass 29.87.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.55, l.c.l. 23.17, c.l. 22.67; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.85, l.c.l. 25.60, c.l. 25.10; magnet, delivered, c.l. 28.50, 15,000 lb or more 28.75, l.c.l. 29.25

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-24	36.8	33.4	39.5
0.008-0.0075	12-24	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	36.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends: List price plus 45%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over. Ribbon znic in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Jan. 25-26	18.50	11.80	9.75	75.00	17.00	28.75	40.00	73.25
Jan. 23-24	18.50	11.80	9.75	75.25	17.00	28.75	40.00	73.25
Jan. 19-21	18.50	11.80	9.75	75.50	17.00	28.75	40.00	73.25
Jan. 17-18	18.50	11.80	9.75	76.00	17.00	28.75	40.00	73.25
Jan. 15-16	18.50	11.80	9.75–10.00	76.00	17.00	28.75	40.00	73.25
Jan. 13-14	18.50	11.80	9.75–10.00	76.25	17.00	28.75	40.00	73.25
Jan. 6-12	18.50	11.80	9.75–10.00	77.00	17.00	32.00	40.00	73.25
Jan. 3-5	18.50	11.80	9.75–10.00	77.50	17.00	32.00	40.00	73.25
Dec. Avg.	18.50	11.80	9.769	78.966	17.00	32.00	40.00	73.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00e; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 28.84c: oval 28.34c; cast 26.87c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.50c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.75c; over 250 lb, 24.75c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbls, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 94.00c, 500 to 999 lb, 94.50c; 200 to 499 lb, 95.00c; less than 200 lb, 96.50c; ball, 1000 lb and over, 96.25c; 500 to 999 lb, 96.75c; 200 to 499 lb 97.25c; less than 200 lb, 98.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 59.7c; 100 or 300 lb drums only, 100 to 500 lb, 51.4c; 600 to 1900 lb, 49.0c; 2000 to 9900 lb, 47.3c, f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 38.00c, f.o.b. Niagara Falls, N. Y.; 40.50c, f.o.b. Cleveland; 39.25c, del., Detroit and Rhiladelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 86.20c; more than 2000 lb, 84.20c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 72.59c; 100 lb kegs 73.59c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	15.50	15.50	14.75
Yellow brass	12.50	12.25	11.37½
Commercial Bronze			
95%	14.50	14.25	13.75
90%	14.25	14.00	13.50
Red brass			
85%	14.00	13.75	13.25
80%	13.62½	13.37½	12.87½
Best Quality (71-80%)	13.37½	13.12½	12.62½
Muntz Metal	11.50	11.25	10.75
Nickel, silver, 10%	14.50	14.25	7.25
Phos. bronze, A	16.75	16.50	15.50
Naval brass	12.00	11.75	11.25
Manganese bronze	12.00	11.75	11.12½

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 15.50; No. 2 copper 14.50; light copper 13.50; composition red brass 12.75; radiators 10.25; heavy yellow brass 9.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.50; No. 2 copper 14.50; light copper 13.50; refinery brass (60% copper) per dry copper content 13.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire, No. 1 13.50-13.75, No. 2 12.50-12.75; light copper 11.50-11.75; No. 1 composition red brass 11.00-11.25; No. 1 composition turnings 10.25-10.50; mixed brass turnings 6.25-6.50; new brass clippings 10.50-11.00; No. 1 brass rod turnings 9.25-9.50; light brass 6.00-6.25; heavy yellow brass 7.25-7.50; new brass rod ends 9.75-10.00, auto radiators, unsweated 8.50-8.75; cocks and faucets, 8.50-8.75; brass pipe 9.00-9.25.

Lead: Heavy 9.25-9.50, battery plates 4.50; linotype and stereotype 10.00-10.25; electrotype 9.00-9.25; mixed babbitt 9.25-9.50.

Zinc: Old zinc 4.25-4.75; new die cast scrap 4.00-4.50; old die cast scrap 3.00-3.25.

Tin: No. 1 pewter 39.00-41.00; block tin pipe 60.00-62.00, No. 1 babbitt 30.00-30.50.

Aluminum: Clippings 2S 10.50-11.00; old sheets 7.50-8.00, crankcase 7.50-8.00, borings and turnings 3.00-3.50.

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IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Jan. 26, 1950; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Jan. 26	$26.83
Jan. 19	26.83
Dec. 1949	28.03
Jan. 1949	41.54
Jan. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$30.00
No. 2 Heavy Melt.	27.00-28.00
No. 1 Busheling	30.00
No. 1 Bundles	30.00
No. 2 Bundles	24.00-25.00
No. 3 Bundles	23.00-24.00*
Heavy Turnings	26.00-27.00
Machine Shop Turnings	20.50-21.50†
Mixed Borings, Turnings	20.50-21.50†
Short Shovel Turnings	25.00-26.00
Cast Iron Borings	24.00-25.00
Low Phos. Steel	32.00-33.00

Cast Iron Grades*

No. 1 Cupola Cast	33.50-34.00
No. 1 Machinery Cast	38.00-39.00
Charging Box Cast	31.00-32.00
Heavy Breakable Cast	27.00-28.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	31.50-32.00
Axles	34.50-35.50
Rails, Random Length	35.50-36.00
Rails, 2 ft. and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	34.00-34.50
Angles, Splice Bars	32.00-33.50

* Nominal.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$27.00-27.50
No. 2 Heavy Melt. Steel	24.50-25.00
No. 1 Busheling	27.00-27.50
No. 1 Bundles	27.00-27.50
No. 2 Bundles	21.00-21.50
Machine Shop Turnings	17.00-17.50
Mixed Borings, Turnings	19.50-20.00
Short Shovel Turnings	19.50-20.00
Cast Iron Borings	19.50-20.00
Low Phos.	29.00-29.50
Cut Structurals	30.00-30.50

Cast Iron Grades

No. 1 Cupola	42.50-43.50
Charging Box Cast	36.50-37.50
Stove Plate	35.50-36.50
Heavy Breakable Cast	33.50-34.50
Unstripped Motor Blocks	31.00-32.00
Brake Shoes	28.50-29.50
Clean Auto Cast	43.50-44.50
No. 1 Wheels	35.50-36.00
Burnt Cast	31.50-32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-32.50
R.R. Malleable	38.50-39.00
Rails, 3 ft and under	42.00-43.00
Rails, 18 in. and under	43.00-44.00
Rails, Random Lengths	38.00-39.00
Cast Steel	34.00-35.00
Railroad Specialties	35.00-35.50
Uncut Tires	36.00-37.00
Angles, Splice Bars	40.00-41.00

VALLEY

No. 1 Heavy Melt. Steel	$30.00-30.50
No. 2 Heavy Melt. Steel	28.00-29.00
No. 1 Bundles	30.00-30.50
No. 2 Bundles	23.50-24.50
Machine Shop Turnings	20.50-21.50
Short Shovel Turnings	22.50-23.00
Cast Iron Borings	21.50-22.00
Low Phos.	31.50-32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.50-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$23.00
No. 2 Heavy Melt. Steel	*21.00-21.50*
No. 1 Busheling	*21.00-21.50*
No. 1 Bundles	23.00
No. 2 Bundles	18.00-19.00
Machine Shop Turnings	*15.00-15.50*
Short Shovel Turnings	*17.00-17.50*
Mixed Borings, Turnings	*15.00-15.50*
Bar Crop and Plate	25.50-26.00
Punchings & Plate Scrap	*25.50-26.00*
Cut Structurals	25.00-26.00
Elec. Furnace Bundles	25.00-25.50
Heavy Turnings	24.00
No. 1 Chemical Borings	29.00
Knuckles and couplers	29.00-30.00
Steel car wheels	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	*30.00-31.00*
No. 1 Machinery Cast	36.00-37.00
Charging Box Cast	34.00
Heavy Breakable Cast	34.00
Unstripped Motor Blocks	*25.00-26.00*
Clean Auto Cast	36.00-37.00
No. 1 Wheels	37.00
Malleable	39.00

CINCINNATI

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	23.00
No. 1 Busheling	26.00
No. 1 Bundles	26.00
No. 2 Bundles	20.00
Machine Shop Turnings	13.00
Short Shovel Turnings	16.00
Mixed Borings, Turnings	16.00
Cast Iron Boring	16.00

Cast Iron Grades

No. 1 Cupola Cast	38.00
Charging Box Cast	32.00
Heavy Breakable Cast	32.00
Stove Plate	30.00
Unstripped Motor Blocks	22.00
Brake Shoes	22.00
Clean Auto Cast	38.00
Drop Broken Cast	42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	30.00
R.R. Malleable	30.00
Rails, Rerolling	34.00
Rails, Random Length	33.00
Rails, 18 in. and under	42.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$21.00-22.00
No. 1 Bundles	23.00-24.00
No. 2 Bundles	20.00-21.00
No. 1 Busheling	23.00-24.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	12.00-13.00
Short Shovel Turnings	14.00-15.00
Cast Iron Borings	16.00-17.00
Punchings & Plate Scrap	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Heavy Breakable Cast	29.00-30.00
Clean Auto Cast	35.00-36.00

BUFFALO

No. 1 Heavy Melt. Steel	$27.50-28.00
No. 2 Heavy Melt. Steel	25.50-26.00
No. 1 Bushelings	25.50-26.00
No. 1 Bundles	26.50-27.00
No. 2 Bundles	24.00-24.50
Machine Shop Turnings	18.00-18.50
Mixed Borings, Turnings	19.00-19.50
Cast Iron Borings	19.00-19.50
Short Shovelings	19.50-20.00
Low Phos.	29.00-29.50

Cast Iron Grades

No. 1 Machinery	36.00-36.50
No. 1 Cupola	34.50-35.00
Malleable	32.00-33.00

Railroad Scrap

Rails, 2 ft. and under	38.00-39.00
Scrap rails	35.00-35.50
Specialties	33.00-34.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	17.50-18.00
No. 1 Busheling	17.50-18.00
No. 1 Bundles	20.00
No. 2 Bundles	16.00
Machine Shop Turnings	10.50-11.00
Mixed Borings, Turnings	10.50-11.00
Short Shovel Turnings	10.50-11.00
Punchings & Plate Scrap	19.50-20.00
Cut Structurals	19.50-20.00
Elec. Furnace Bundles	19.50-20.00

Cast Iron Grades

No. 1 Cupola Cast	26.00-27.00
No. 1 Machinery	*27.00-28.00*
Charging Box Cast	26.00-27.00
Heavy Breakable	26.00-27.00
Unstripped Motor Blocks	20.00-21.00
Malleable	34.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.00-19.00
No. 2 Heavy Melt. Steel	17.00-17.50
No. 1 Bundles	18.00-19.00
No. 1 Busheling	17.00
Machine Shop Turnings	9.00-10.00
Mixed Borings, Turnings	9.00-9.50
Short Shovel Turnings	12.00-13.00
Bar Crops and Plate	20.00-21.00
Punchings & Plate Scrap	20.00-21.00
Chemical Borings	18.00-19.00

Cast Iron Grades

No. 1 Cupola Cast	29.50-32.50
Mixed Cast	*23.00-24.00*
Heavy Breakable Cast	26.50-27.50
Stove Plate	23.50-24.50
Unstripped Motor Blocks	19.50-20.50

CHICAGO

No. 1 Heavy Melt. Steel	$27.00-28.00
No. 2 Heavy Melt. Steel	*25.50-26.50*
No. 1 Bundles	27.00-28.00
No. 2 Bundles	22.00-23.00
Machine Shop Turnings	18.00-19.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings	20.00-21.00
Cast Iron Borings	18.00-19.00
Low Phos.	*30.50-31.50*
Elec. Furnace Bundles	27.00-28.00
Heavy Turnings	23.00-24.00
Cut Structurals	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	*40.00-41.00*
Clean Auto Cast	*41.50-42.50*
No. 1 Wheels	33.00-34.00
Stove Plate	31.00-32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50-29.50
Malleable	35.00-36.00
Rails, Rerolling	39.00-40.00
Rails, Random Lengths	32.00-33.00
Rails, 2 ft. and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	30.00-31.00
Angles, Splice Bars	34.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.00
No. 2 Bundles	22.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	30.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R. R. Malleable	nominal
Rails, Rerolling	37.00
Rails, 3 ft. and under	25.00-26.00
Angles and Splice Bars	31.00-33.00

ST. LOUIS

No. 1 Heavy Melt. Steel	*$28.00-29.00*
No. 2 Heavy Melt. Steel	*24.00-25.00*
Machine Shop Turnings	14.00-15.00
Short Shove Turnings	18.00-19.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
Charging Box Cast	29.00-30.00
Heavy Breakable Cast	28.00-29.00
Brake Shoes	27.00-28.00
Clean Auto Cast	36.00-38.00
Burnt Cast	27.00-28.00

Railroad Scrap

R.R. Malleable	27.00-28.00
Rails, Rerolling	36.00-37.00
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under	36.00-37.00
Uncut Tires	27.00-28.00
Angles, Splice Bars	32.00-33.00
Railroad Specialties	30.00-31.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	15.50
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	22.00
Cut Structurals	22.00
Elec. Furnace Bundles	23.00

Cast Iron Grades

No. 1 Cupola Cast	27.50-30.00
Heavy Breakable Cast	20.00
Stove Plate	20.00
Unstripped Motor Blocks	18.00
Malleable	20.00
Brake Shoes	18.00
Clean Auto Cast	25.00
No. 1 Wheels	25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	19.00
Railroad Malleable	25.00
Rails, Random Lengths	19.00
Angles and Splice Bars	19.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Elec. Furnace Bundles	25.00

Cast Iron Grades

No. 1 Cupola Cast	27.00-29.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	32.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$24.00
No. 1 Bundles	24.00
Mechanical Bundles	22.00
Mixed Steel Scrap	20.00
Mixed Borings, Turnings	18.00
Rails, Remelting	24.00
Rails, Rerolling	27.00
Busheling	18.00
Bushelings new factory, prep'd	22.00
Bushelings new factory, unprep'd	17.00
Short Steel Turnings	18.00

Cast Iron Grades*

Cast	40.00-43.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

"V-Belt Inventory? ... it's no problem since we standardized on VEELOS!"

4 REELS OF VEELOS *replace* 316 SIZES OF ENDLESS V-BELTS

Write for your VEELOS Data Book... it's free and it's full of engineering, measuring and installation information on Veelos. Everyone interested in power transmission should have a copy for ready reference.

MANHEIM MANUFACTURING & BELTING CO.
MANHEIM, PENNSYLVANIA

"I DON'T like to tie-up operating capital . . . who does? That's why, in our plant, we use Veelos on all v-belt drives. In the old days our stockroom was a dangling mess of endless v-belts. But no more. Now, on wall space only sixteen inches square, hang 4 reels of Veelos. Those 4 reels in O, A, B and C widths take care of *all* our v-belt needs. Simple story sure, but a sound, practical picture of saving money the Veelos way."

And there are other advantages beyond the saving of inventory when you standardize on Veelos, the adjustable v-belt. Veelos is easy to install—just measure and couple. You never dismantle outboard bearings to replace Veelos v-belts—that keeps machine downtime at rock bottom. Uniform operating tension, smooth, vibrationless power delivery and long life are more plus values from Veelos.

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

VEELOS
THE LINK
V-BELT

Veelos is made in all standard sizes; fits all standard v-belt grooves. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. Veelos is known as VEELINK outside the United States.

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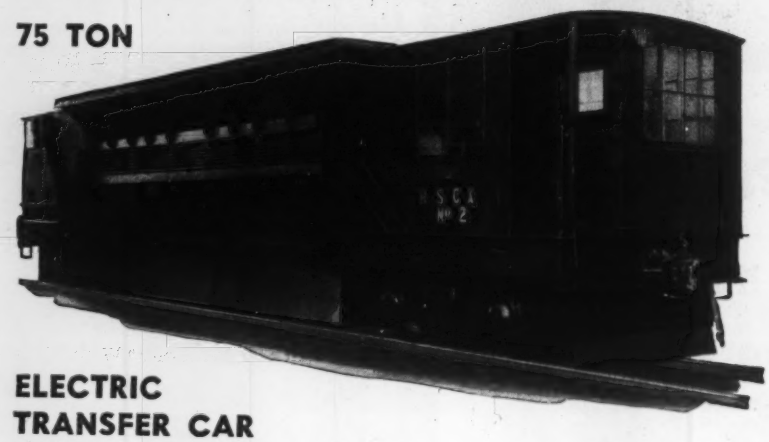
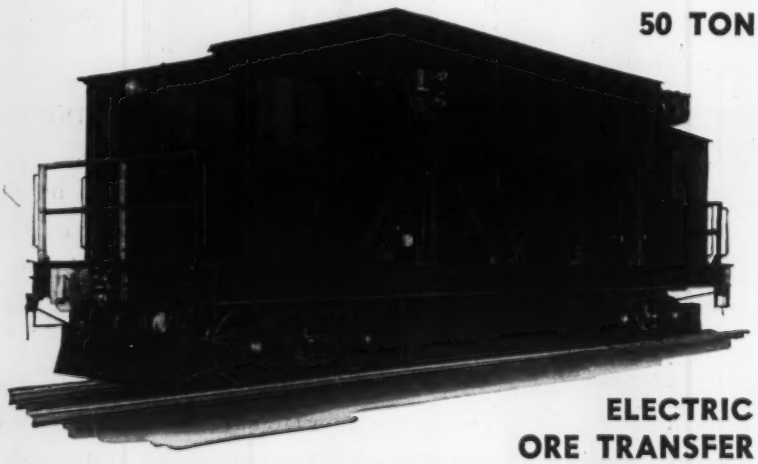
75 TON



ELECTRIC
TRANSFER CAR
GABLE BOTTOM

Car built in two sections with independently operated discharge gates for either side of track. Car has self-aligning journal bearings, electric heaters and is propelled with two 75-HP motors. Equipped with air brakes, sanders and standard safety equipment.

50 TON



ELECTRIC
ORE TRANSFER
GABLE BOTTOM SIDE DUMP

Car has single discharge gates on either side, operated pneumatically. Trucks have self-aligning journal bearings each mounting a 75-HP motor. Car equipped with air brakes and other standard safety equipment.

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ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

Sheets, Strip . . .

Sheet and Strip Prices, Page 87 & 88 & 89

Pittsburgh—Several producers have reduced gage and width extras on cold-rolled sheets in 25 through 28 gage for widths 12 to 20 inches, $1 to $2 per ton; they have reduced cutting-to-length extras $6 per ton for 25 gage and lighter in length brackets 12 to 36 inches, inclusive. This action is prompted by fact cold-rolled sheet prices in these light gages exceed those for tin mill black plate.

Bethlehem Steel Co.'s schedule of extras covering hot-rolled strip lists thickness and width extras for sheared or slit edge in coils or cut lengths based on sheet mill tolerances; there is no separate extra for cut edge.

Faced with necessity to absorb an additional $5.50 per ton in production of cold-rolled strip, nonintegrated interests are considering advancing price base to $4.40 per 100 pounds for 20 gage and heavier. Such action has not been officially taken but some small interests are selling up to 35 cents above the $4.15 price base announced by integrated mills.

Silicon steel demand also is well sustained with most sellers booked well into April. There is a definite trend toward preference for silicon steel in coils because of lower production costs in stamping out laminations for motors and fabrication of small transformers.

Boston—Several producers of narrow low-carbon cold-rolled strip are considering allocation of tonnage Apr. 1, although indirectly this operates to some extent currently, dependent on availability of hot rolled for converting. New card of extras for cold strip is being studied, notably on low carbon where margin for that grade has narrowed. For some time there have been varying extra charges in coil size weight extras. Demand for sheets holds at top level with some producers sold through second quarter.

New York—Little or no let-up is noted in sheet demand here. With mill delivery schedules well advanced, consumers are devoting much attention to getting shipments against tonnage already on order and trying to place new tonnage where spot openings in mill schedules make such possible. To date, they have not had too much luck, for producers have not been able to make much progress on arrearages, while spot openings are few. Cold-rolled and galvanized sheets are the most scarce of all major items, but hot-rolled sheets are not far behind.

Philadelphia—Sheet demand continues active. Consumers are speculating as to possible effect on supply of the strike at Chrysler plants. Whether important cutbacks will result at the mills is a source of interest to consumers looking for spot openings.

Cincinnati—District sheet mills are pushed to capacity with pressure for deliveries unabated. Demand for early shipments has been increased by threats to production due to shrinking coal supplies.

Cleveland—Light, flat-rolled products are virtually sold out for first half. Producers are turning tonnage

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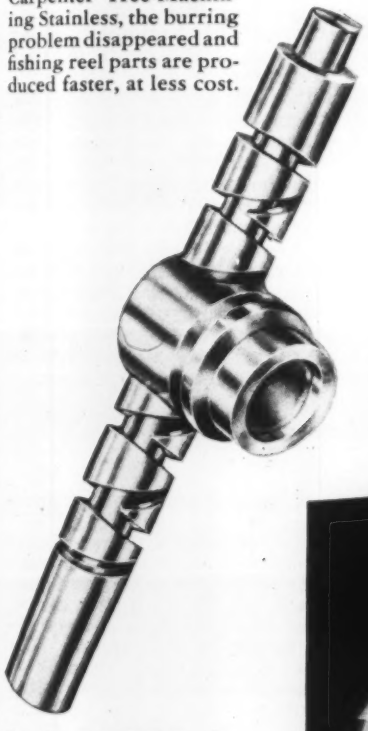
—use this *Carpenter* help!

NO MORE COSTLY HAND WORK...

Excessive burring during machining caused rejects, or expensive hand work to "salvage" the parts from the scrap heap. Because of the change to Carpenter Free-Machining Stainless, the burring problem disappeared and fishing reel parts are produced faster, at less cost.



You Can Turn It Out AT LESS COST with Carpenter Free-Machining Stainless!

The cost of the steel you buy is only a fraction of the cost of the finished products made from Stainless. To get a lower *unit* cost for every Stainless part you make, take advantage of the help that Carpenter can give you.

Our help starts with the *uniformity* of the free-machining Stainless you buy from your Carpenter warehouse. Every lot machines the same, to the finish you want.

Next, Carpenter's STAINLESS MACHINING "NOTEBOOK" gives correct information on speeds, feeds and tooling, etc.... and Check Charts that list common "trouble spots" with shop tips on how to cure them. For your NOTEBOOK, send us a note on your company letterhead, indicating your title, please. Extra copies of the NOTEBOOK, for the men in your shop, are available at 50¢ each.

Using Carpenter's SHOP HELP ON NEW JOBS is another way to bring down the cost of working with Stainless, where special requirements or close tolerances are important. Combine your nearby Carpenter representative's experience with easy-to-work Carpenter Stainless bars, and you have a large part of the answer to low cost machining on your Stainless jobs. Get in touch with the nearest office listed below.

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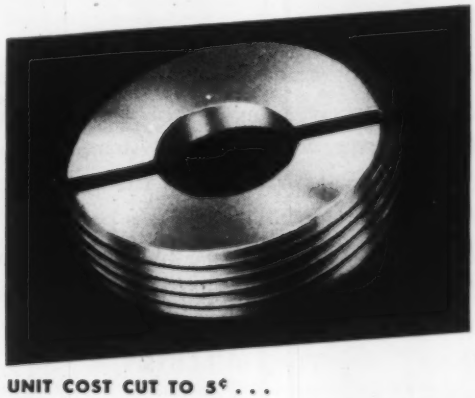

UNIT COST CUT TO 5¢...

Production slow, rejects excessive and unit costs "impossible"—until Carpenter Stainless No. 8 (Type 303) was used for making this bearing race. Unit cost now reduced to 5¢... tool life more than doubled, 40% fewer rejects of finished races.

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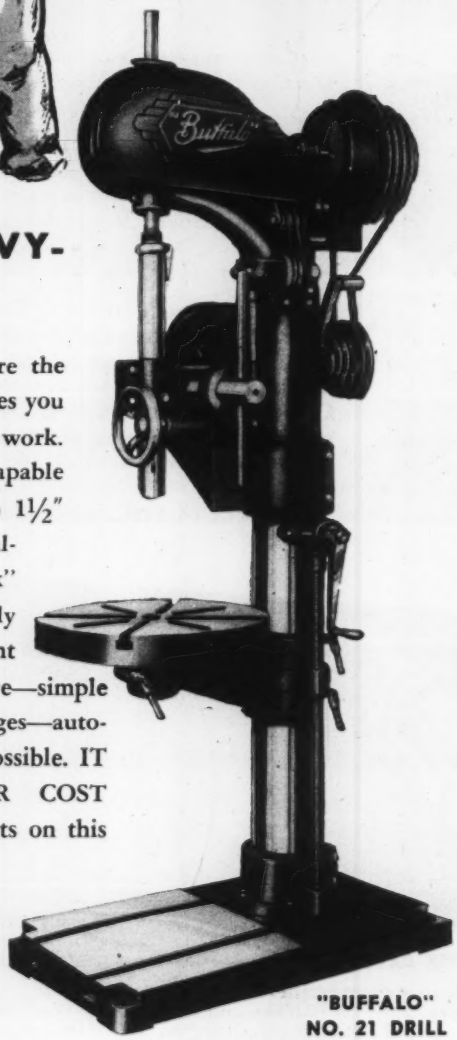

"BUFFALO" NO. 21 DRILL

For Profitable HEAVY-DUTY DRILLING

"BUFFALO" NO. 21 DRILLS are the answer to those "pressure" schedules you often have to meet in general shop work. Rugged and powerful, they're capable of continuous, heavy work up to 1½" in cast iron. And their controls allow operators to "eat up the work" easily and accurately. Eight quickly changed speeds—four convenient feeds—direct or back-geared drive—simple crank controls for fast setup changes—automatic depth control—make this possible. IT MEANS YEARS OF LOWER COST DRILLING! Why not get the facts on this popular "Buffalo" machine? Simply write for BULLETIN 3746.

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158 Mortimer St. **Buffalo, N. Y.**

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

No. 21 DRILL

away since they decline to commit themselves for third quarter. As a result, an extremely tight supply situation prevails though it by no means is comparable with that of 1947 and 1948. At least, consumers are not scrambling for tonnage like they were in those days. Gray market operators are not reaping the harvest they once did, and conversion deals are not numerous.

Chicago—Sold-out condition of all mills through second quarter has consumers trying to sew up third quarter tonnage. Present outlook is that allocations will be continued. Pressure for first quarter shipment has intensified, reflecting fear of possible lower production due to the coal situation.

St. Louis—Pressure for cold-rolled sheets has intensified the last 10 days. Mills wonder whether it's from hedging against a possible coal shutdown or the beginning of an acute shortage. Pickup is heaviest in conversion work. Some large users are withdrawing from conversion deals themselves and putting subcontractors into it. In the last two weeks, for example, an auto subcontractor began sending coils from the East for conversion here and reshipment to Detroit.

Birmingham—Sheets, although being produced at capacity, are still not available as freely as had been hoped. Considerable easing of overall pressure is evident with full scale production of the cold reduction mill at Fairfield, but sheets are still tight.

Wire . . .

Wire Prices, Page 89

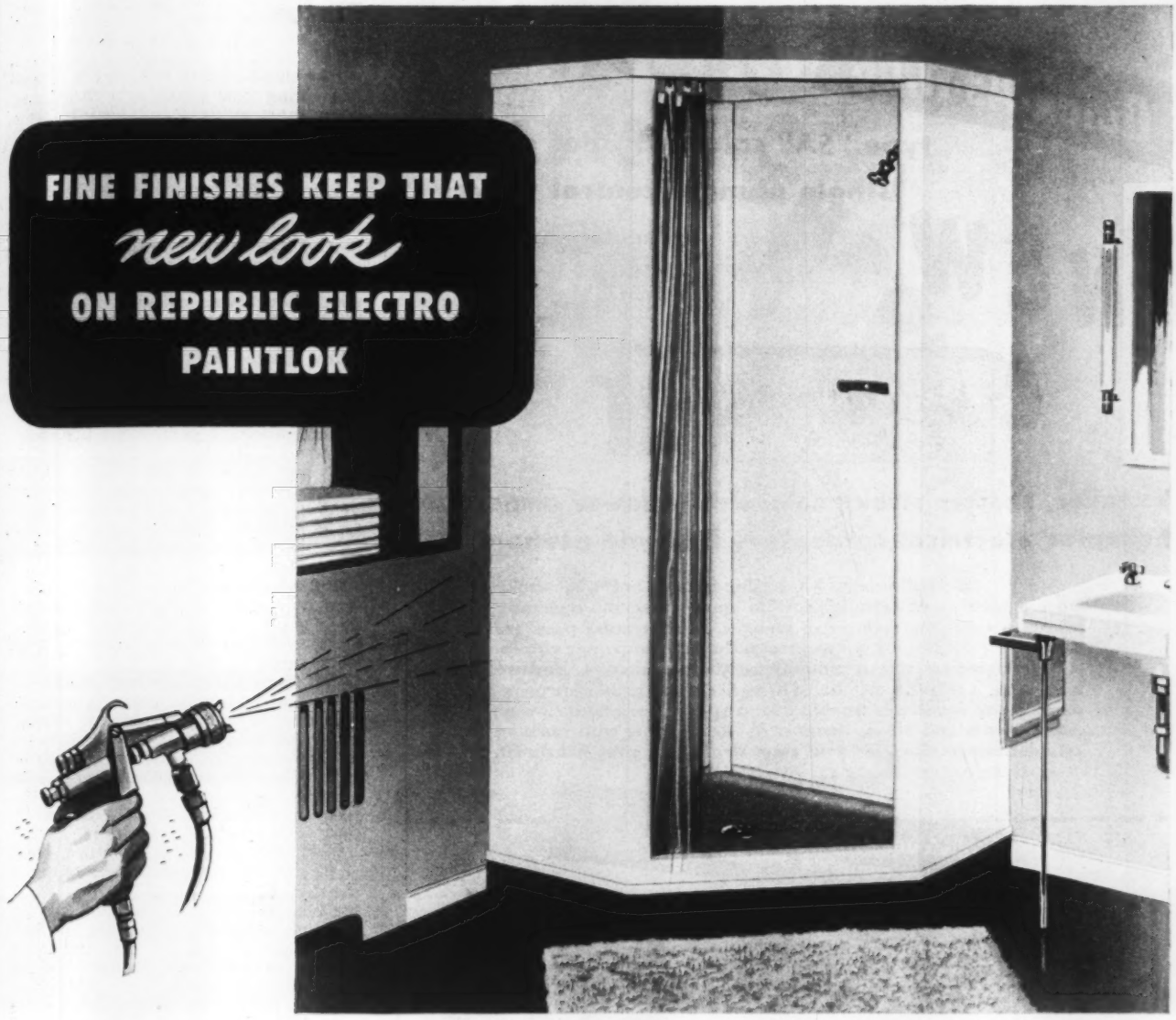
Boston—With few exceptions prices have been revised upward on wire specialties. Advances in base prices are not uniform, each product standing on its own from a margin standpoint. As in products adjusted earlier, impact of new extras is a more important factor to consumers. Untempered scratch brush wire is $1 a ton higher on basis of new extras. One leading producer has made no change in valve spring base prices, but base quantity, one size, carlots, is now 10,000 pounds against 6000 pounds formerly.

Philadelphia—Nail deliveries are far extended. One eastern producer is booked into June. The situation in six, eight and ten penny nails is especially tight. Fence wire and barbed wire shipments are slightly more advanced than they were; around four to six weeks.

Chicago—Wire producers are in about the same shape as in last spring's sellers' market. Peak operations are assured for several months, particularly in view of mounting demand for merchant products from the farm trade. Jobbers' inventories are scanty except in scattered items. Manufacturers wire and nails are sorely needed items; fencing and barbed wire supplies are tight.

Birmingham—Wire products have firmed considerably in the last 10 days. The building program locally, strong and well sustained, is accounting for much nail tonnage and unseasonably warm weather is responsible for heavy demand for fencing.

FINE FINISHES KEEP THAT *new look* ON REPUBLIC ELECTRO PAINTLOK



The walls of this shower cabinet will continue to look new for a long time to come—because the finish is white synthetic enamel baked on sheets of Republic ELECTRO PAINTLOK.

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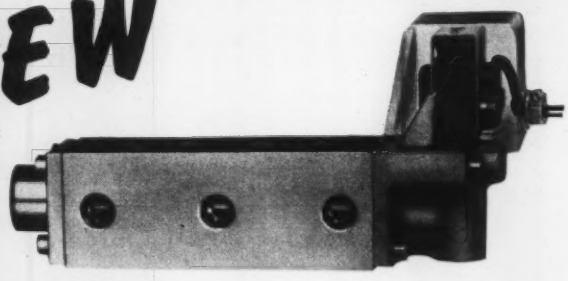

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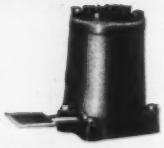

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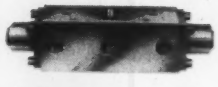

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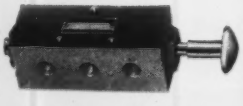

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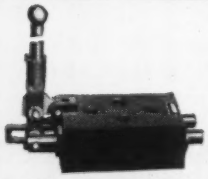

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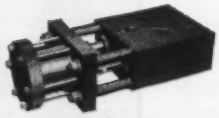

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Plates . . .

Plate Prices, Page 87

Cleveland—Plate sellers are actively seeking new business with demand from fabricators disappointing. Some of the sluggishness is seasonal, but lack of new volume business from the railroad car shops is keenly felt.

Some ship repair work is being done and is providing small tonnage business. Tank fabricators are reported specifying in fair volume.

Despite sluggish demand, prices are firmly established at 3.50c f.o.b. mill, which level was effected in December and represents an increase of $2 per ton over the mill price previously quoted by most sellers.

New York—Plate demand shows little improvement, with most eastern producers making shipments in three to four weeks, less in some instances. Lack of important railroad and oil and gas work is the major factor for dullness. Important ship work also is absent. Distributors have brought their plate stocks into balance, and are specifying on a reduced scale.

Philadelphia—Plate specifications continue slack. Most eastern producers are having difficulty building backlogs. Delivery promises of three weeks can be had on most specifications from three district mills.

Pittsburgh—Most plate fabricators continue to make headway against order backlogs as tonnage involved in new inquiries remains disappointing. This is particularly true of inquiries for tanks, ship repairs and freight car construction. Order backlogs extend three to four months among the larger fabricators, while some smaller concerns have only one month's business ahead.

Chicago—Plate capacity is sold out through second quarter for at least one local producer. An important source of renewed pressure is the pipe line industry, but other consumers cannot be discounted.

Birmingham—Plate demand has inched upward over the past few weeks. Plate needs, including every variety, are originating over a wide area in the southeast. Pullman Standard has resumed productioin of cars at Bessemer, augmenting tightness in supplies.

Rails, Cars . . .

Track Material Prices, Page 89

New York—Freight car activity has shown some improvement since the first of the year, although the situation is far from brisk. Most sellers of car steel anticipate no major buying movement in first quarter and are keeping their fingers crossed on second quarter prospects.

Rail-laying program of the Missouri Pacific for 1950, which calls for expenditure of $4,703,720 for rails and accessories, has been approved by United States District Judge George H. Moore. The cost is based on prices in effect Dec. 30, 1949.

Birmingham — Southern Pacific Railroad has placed an order with the Bessemer plant of Pullman-Standard Car Mfg. Co. for 2000 all steel box cars. The order is valued in excess of $8 million.

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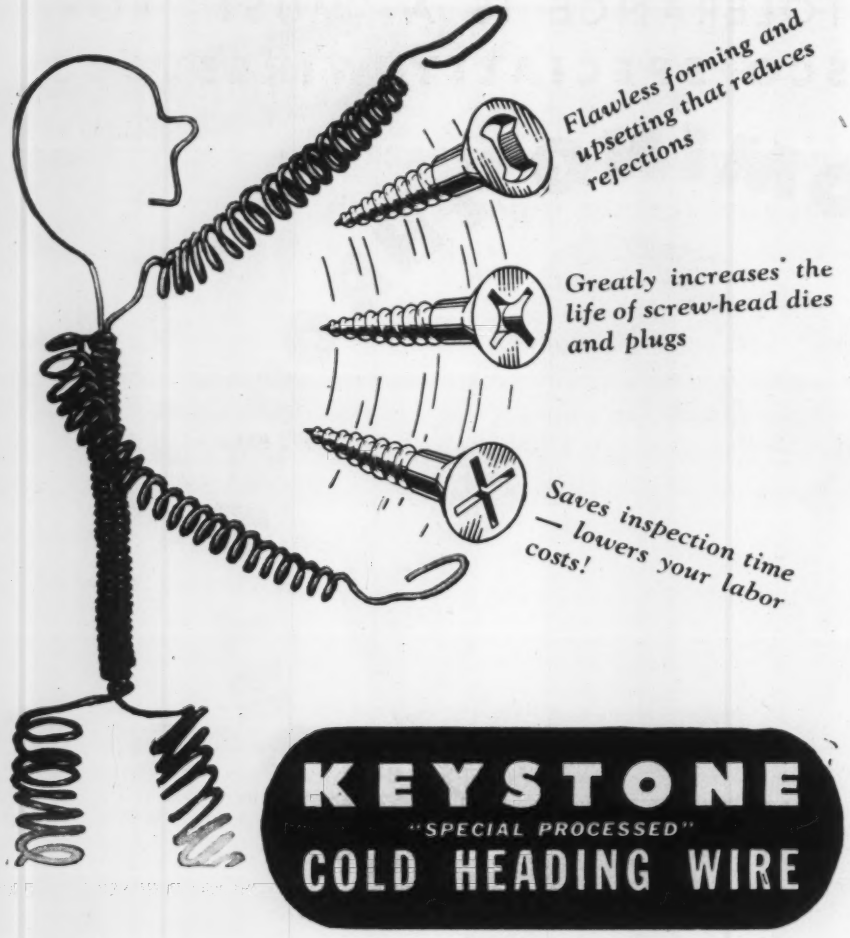
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Steel Bars . . .

Bar Prices, Page 87

Boston—New volume of carbon bar orders is lower with most users covered through this quarter. Pressure for delivery of small sizes is heaviest and delivery in this range is most extended. Some larger sizes are available in four to five weeks.

New York—Hot carbon bars are in fair balance. Consumers have no great difficulty in getting shipments within four to six weeks. By shopping around a bit they can do even better on medium and larger sizes.

Pittsburgh—Most sizes of merchant carbon bars are available in six to eight weeks, hot-rolled alloy and cold-finished carbon and alloy bars within four to six weeks. Some alloy cold-finished standard specifications are available from stock. Automotive industry maintains its position as the leading consumer of bar products. Demand is also fairly heavy from farm implement concerns. Cold finishers are experiencing fairly good demand from electrical appliance companies. Demand from screw machine interests and fastener producers lags.

Superior Drawn Steel Co., Monaca, Pa., advanced cold-finished alloy bars $5 per ton to $4.90 per 100-pound base, effective Jan. 18.

Cleveland—Consumer pressure for bar shipments is only moderate indicating that stocks are in pretty good balance. In hot-rolled carbon bars producers can give March delivery. Cold-finished bars are available in late February.

Chicago—Larger sizes of carbon bars can be ordered for first quarter delivery, but for all popular sizes, mills are booked into next period. Mills are shipping close to delivery promises.

Stainless Steel . . .

Stainless Steel Prices, Page 90

Pittsburgh—Mounting production costs soon may be reflected in higher prices for stainless steel. H. G. Batcheller, chairman of the board, Allegheny Ludlum Steel Corp., told the Joint Committee on the Economic Report in Washington that "the price relief we have thus far obtained is by no means enough and we are presently considering an increase in the price of stainless steel." Demand for stainless has improved substantially.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 87

Cleveland — Despite the open weather throughout this area reinforcing bars are not particularly active. Considerable repair work is reported but most jobs are small, involving limited tonnage. Competition for those jobs that do come out is keen. Expectations are sluggish demand will be experienced until March when building seasonally expands.

Los Angeles — Public construction remains the largest factor in the reinforcing bar market. Bids will be opened this week by the city of Los Angeles for a five-level underground garage, estimated to cost $5 million.

Structural Shapes . . .

Structural Shape Prices, Page 87

New York—Public work is improving, although most fabricators look for rather restricted volume over the next few weeks. By middle of March, they expect backlogs to swing upward.

Philadelphia — Structural fabricators' backlogs continue to decline. The Phoenixville, Pa., producer is putting its larger mill into operation. The smaller mill has been in production for some time.

Pittsburgh—Unusually keen competition in bidding on new inquiries indicates dwindling order backlogs among fabricators. In most instances fabricators not only are absorbing higher steel costs but are quoting firm prices at levels below six months ago. Mill deliveries for wide flange beams extend into April. Standard structural shapes and plates are available in four to six weeks.

Chicago—Quotas have not appeared necessary on plain shapes but producers have accepted business well into second quarter, thus making the range of products for which new business can be booked for nearby delivery restricted.

Los Angeles—Industrial growth of Southern California increased in 1949 to a pace 30 per cent ahead of 1948. Last year's total of $93,415,000 for new plants and expansions in Los Angeles county compared with $72,181,000 for 1948.

Seattle—Fabricating shop operations are off seasonally. Some inquiry for small tonnages is reported.

Tubular Goods . . .

Tubular Goods Prices, Page 90

Boston—Although some merchant pipe suppliers are over-scheduled with shipments behind schedule, others are improving deliveries. Movement of secondary stocks are seasonally slow. Warehouses have held up merchant pipe shipments in scattered instances. More electric weld tubing capacity is developing in this area with a new mill operating at Wallingford, Conn., producing ½ to 3 in. tubing.

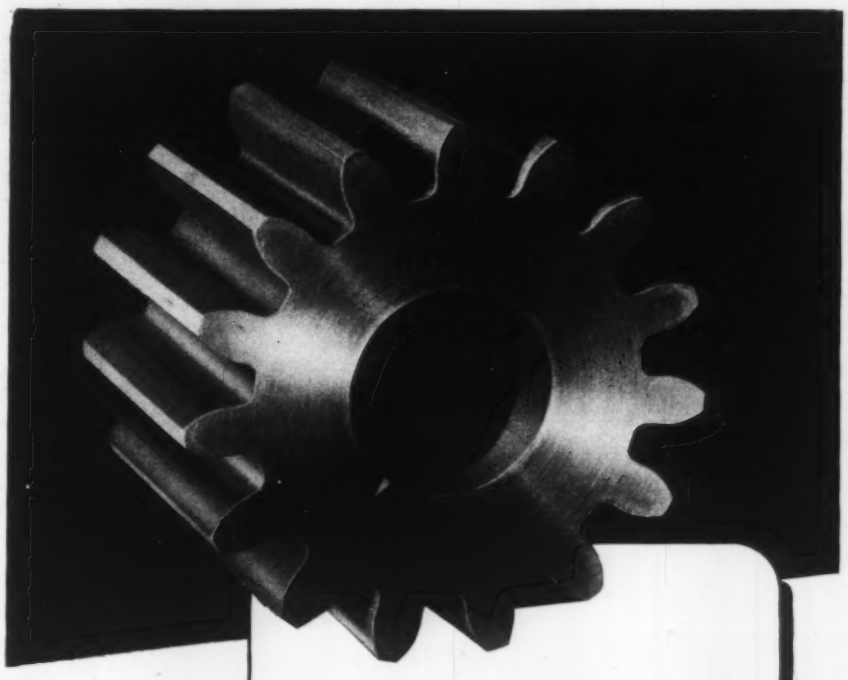
Pittsburgh—A. M. Byers Co., Pittsburgh, recently advanced wrought iron pipe $4 to $12 per ton as follows: six points in sizes ⅛ in. to 1¼ in., 3 points for 1½ inch and 2 points for 2 in.

Carbon steel tubing producers' order backlogs represent four to six weeks' capacity output of pressure and mechanical tubing. Jobbers' stocks of standard pipe items have been augmented somewhat following termination of industry-wide steel strike last fall.

Cleveland—Babcock & Wilcox Tube Co., Alliance, O., effective Jan. 24, announced adjustments in prices on electric resistance welded carbon steel mechanical tubing made from both cold-rolled and hot-rolled strip.

Los Angeles—Although oil field demand has not improved, and large diameter pipe is in easier supply, requirements for smaller sizes generally remain strong.

Seattle—Demand for cast iron pipe remains static with increasing competition noted from other types.



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Warehouse . . .

Warehouse Prices, Page 91

Cleveland—Local warehouse order volume is improved though tonnage in some products is disappointing. Open weather has encouraged considerable repair work with resulting demand for certain steel items that normally would be dormant at this season.

Philadelphia — Distributors are winding up a fairly good month. Some predict that business will be appreciably ahead of December, which was adversely affected by the holidays.

Los Angeles—Distributor activity has improved moderately, and inquiries are in greater volume. The price situation, however, is confused. One major warehouse has increased most items, but other sellers have not followed. Price cutting is being done in the form of special deals.

San Francisco—No pick-up has occurred in distributors' volume and there's no sign of an immediate upturn. Customers are pressing for galvanized and cold-rolled sheets, but there's little active demand for other steel products. Warehouse supplies except for those flat-rolled items are ample, and, in some cases, have become top heavy.

Seattle—Heavy snows have restricted outdoor construction. Warehouses report slow business. Hot-rolled strip has been reduced from 7.35c to 6.90c in line with mill revisions on widths.

Tin Plate . . .

Tin Plate Prices, Page 88

Pittsburgh—Tin plate sellers anticipate full production schedules at least throughout first half. In most instances, only a little business has been booked for April on a firm basis, since producers are booking only 60 days ahead. Producers are experiencing little difficulty in selling secondary quality items. Demand is particularly heavy for electrolytic, notably for beer and coffee containers.

Iron Ore Prices Advance

Cleveland—Iron ore will cost more this year than last. Cleveland-Cliffs Iron Co. on Jan. 25 announced a 50 cents per ton increase for 1950 delivery. Other lake shippers are expected to take similar action.

The new schedule of prices quotes Mesabi Range nonbessemer ore $7.70; Mesabi Range bessemer, $7.85; Old Range nonbessemer, $7.95; Old Range bessemer, $8.10; high phosphorus, $7.70.

Substantial tonnage of 51.50 per cent natural iron content ore has been sold at the higher prices.

The increase is attributed to increased mining costs. Rapid depletion of open pit mines at the head of the lakes is compelling increasing reliance on higher-cost underground mines. Six times as many men are required in underground mining of direct shipping ore, as in open pit mining, and from three to four times as many as are necessary in production of open pit ore requiring beneficiation. Hourly wages on the ore ranges have more than doubled since 1939.

It is pointed out in the trade that even with this latest increase the price of iron ore is still only 55.6 per cent above that in 1939 whereas in the same period finished steel prices advanced 65.9 per cent, scrap 64.2 per cent, coal 100.3 per cent, pig iron 116.5 per cent and wholesale commodity prices 96.4 per cent.

Iron Ore . . .

Iron Ore Prices, Page 91

Cleveland—Stocks of Lake Superior iron ore at 38,628,510 tons on Jan. 1, were down 6,157,959 tons from Dec. 1 and 831,987 tons from Jan. 1, 1949, reports the Lake Superior Iron Ore Association. Of the total, 31,270,534 tons were at furnaces in the United States, 1,273,371 at furnaces in Canada, and 6,084,605 on Lake Erie docks.

Steelworkers' strike in fourth quarter last year was the chief factor in the drop of 9,671,433 tons in consumption last year. Total use came to 70,832,782 tons, of which 68,029,617 tons were in the United States, compared with 80,504,215 in 1948, of which 77,661,343 tons were in this country. December use increased to 6,760,481 tons from 3,520,027 in November.

Refractories . . .

Refractories Prices, Page 91

Chicago—New schedule of prices was announced last week by the Chicago Retort & Fire Brick Co., this city, on fire clay brick. It now quotes superduty brick at $106 against $100 formerly; high heat duty $86 against $80; intermediate heat duty $80 against $74 and low-heat duty $70 against $66. All prices are f.o.b. Ottawa, Ill.

Pig Iron . . .

Pig Iron Prices, Page 86

Boston—Due to continued low melt, foundry consumers are not taking contract allotments of pig iron. Releases are expected to improve next month. Many shops have been able to go through January on inventory. Foreign iron is offered at Boston around $42 per ton, but only a little tonnage has been bought.

Philadelphia—Early settlement of strikes at a number of AFL foundries in this immediate area, which began three weeks ago, is anticipated. This should result in a better movement of pig iron and coke.

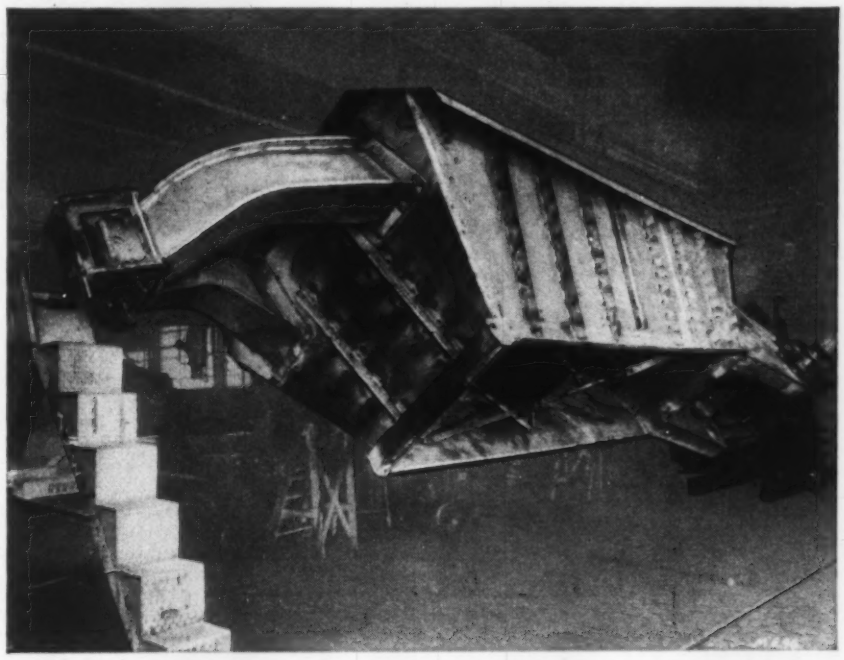
Buffalo—The leading merchant iron seller in the district reports improvement in deliveries this month but foundry operations fail to show any pronounced betterment. Pig iron production bounced back to 87½ per cent of capacity as Bethlehem Steel's Lackawanna plant reactivated five blast furnaces which were banked due to a strike on a switching railway serving the plant.

Pittsburgh—Dwindling coal supply forced Crucible Steel Co. to bank one blast furnace at its Midland plant, leaving 40 out of 47 units pouring iron. Despite relatively poor operations among jobbing foundries and those serving the railroad industry, merchant iron demand is expected to absorb the entire output of leading merchant producer throughout first quarter. This situation forced resumption of operations at the Struthers, O., furnace in late December.

New York—Pig iron production in December was 5,183,584 tons, bringing total for 1949 to 53,613,779, according to American Iron & Steel Institute. Ferromanganese and spiegel production in December was 47,131, bringing total for year to 592,564. Grand total for last month was 5,230,715 tons, making 1949 total 54,206,343. December rate was 87.5 per cent. That for year averaged 76.8.

Chicago—Inland Steel Co. on Jan. 19 blew out its No. 3 furnace, producing between 500 and 600 tons of foundry iron daily and reduced the wind on other units to conserve dwindling coal stocks. Carnegie reports coal stocks at less than five weeks supply and curtailments may be necessary in a relatively short time.

Cleveland—Merchant pig iron market is more active in the Midwest than in the East. Producers are shipping steadily on contracts and are booking some new business. Foundry operations are reported improving. Prices are firm. Production has not yet been affected by the coal shortage but curtailment



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is beginning. Youngstown Sheet & Tube Co. began to curtail at Youngstown last week.

Whether the increase of 50 cents per ton in iron ore prices for 1950, just announced, will be reflected in an advance in pig iron prices is uncertain.

Birmingham—Pig iron production is at capactiy. Merchant iron melters are well booked and anticipate little, if any, slackening before next quarter. The recent price increase announced by Republic Steel Corp. has not been followed by Sloss Sheffield and Woodward Iron.

Scrap . . .

Scrap Prices, Page 94

Boston—Scrap prices are for most part unchanged, but untested by lack of buying. Especially dull are borings and turnings with top turning offers generally $10, although $10.50 has been bid for Pennsylvania material. Some scattered buying of No. 1 heavy melting steel ranges from $18.50 to $19, with select tonnages bringing $19.50. Cast is in doldrums. Some larger users with inventories sold mixed cast, making partial replacements with No. 1 machinery and textile cast at $32-$33.50, delivered.

Philadelphia—Scrap continues to ease in some grades, although the undertone is definitely stronger than a couple of weeks ago. No. 2 heavy melting steel, No. 1 busheling, machine shop turnings, short shovel turnings, mixed borings and turnings, punchings and plate scrap are off slightly.

Buffalo—Offerings of scrap are available within quoted price ranges, but the market is stalemated as consumers are withholding bids. Dealers are shipping against old contracts and are paying on the basis of present prices to cover commitments. They are complaining about more rigid inspection invoked by mills.

Shipments have been resumed to Bethlehem's Lackawanna plant which was forced to suspend operations for a short period when the South Buffalo Railway, which serves the plant, was hit by a strike.

Pittsburgh—Scrap market activity continues limited to occasional purchase of small tonnages through dealer channels with bulk of mill receipts originating from customers. Reduction of 25 per cent in steelmaking schedules at one mill and threatened curtailment among other producers, due to dwindling coal stocks, has dampened dealer optimism over possible upturn in February delivery price levels.

Cleveland—Mills are showing no interest in stepping up their purchases of scrap despite the possibility they may have to increase consumption to conserve pig iron. Coke production has been curtailed and a reduction in blast furnace operations may be ordered if coal shipments are not increased soon. Scrap supplies are more than ample to support present steelmaking operations and are being steadily augmented by large receipts of industrial scrap.

Detroit—Suspension of all Chrysler operations will put a dent in scrap supply here although immediate ef-

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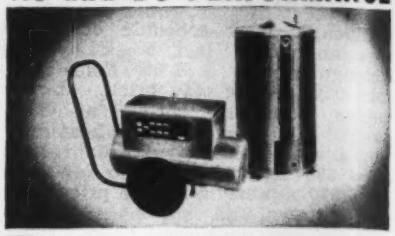

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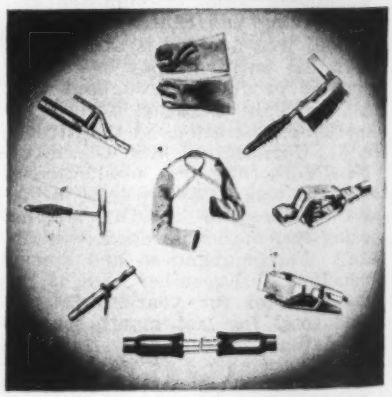

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fect will not be too serious. Car and truck output of the struck plants was better than 6000 units daily. Subtracting the resulting scrap tonnage from available supply of industrial material lends a bullish note to the price trend.

Cincinnati—Mills are well supplied with scrap, but are accepting shipments. Buying lacks urgency. Foundry demand is spotty. Prices are fairly steady.

Chicago—Scrap men are optimistic despite the threat to steel mill operations that the coal situation holds. Prices on a number of grades are higher, including No. 2 heavy melting steel and cupola cast. Scrap is moving to virtually all district mills, although the troubled situation with respect to bundles still exists. One mill within the last week issued release orders for shipment of their outstanding commitments. Another mill, however, continues to completely boycott this grade because of quality. The big order for this material, reported to amount to 15,000 tons, is understood to involve both 1 and 2 grades. Some brokers are working on a 50-cent profit on No. 1 and No. 2 heavy melting. Railroad material continues to attract higher broker bids than consumers presently are paying.

New York—Scrap brokers' buying prices are unchanged on steel grades. However, on No. 1 machinery cast brokers have reduced prices to $27-$28 f.o.b. shipping pint. Trading is listless.

St. Louis—Scrap remains extremely dull with prices drifting lower. Mills' stocks exceed 30 days supply and there is little prospect of heavy buying before late February.

Los Angeles — Undertone of the scrap market is soft, with demand moderate. Rejections are increasing under mills' scrutiny for quality. Scrap collections are heaviest in months, increasing dealers' inventories.

Seattle—Scrap market is slow with very little tonnage moving. Buying is hand-to-mouth. Prices are unchanged, No. 1 and No. 2 holding at $18. Bethlehem Steel Co. has purchased a limited amount of cast iron scrap and plans to resume purchases of steel making grades next month.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, addition to University of Washington stadium, Seattle, to Consolidated Western Steel Corp., Seattle; Strand & Sons, Seattle, general contractors.

2000 tons, Sullivan Square reconstruction, Boston, to Lehigh Structural Steel Co., Allentown, Pa.; M. DeMatteo Construction Co., Quincy, Mass., general contractor.

1750 tons, state bridges, route 128, Needham-Wellesley-Newton-Weston, Mass., to Amerbridge; V. Barletta Co., Boston, general contractor.

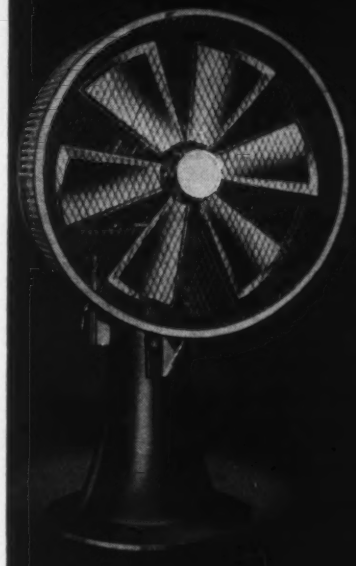
300 tons, bus structures etc., for Bonneville Power Administration, to Berkeley Steel Co., Berkeley, Calif.

120 tons, transmission towers, Pennsylvania Power & Light Co., Harrisburg, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

100 tons, mill addition, Precision Drawn Steel Co., Camden, N. J., to Belmont Iron Works, Eddystone, Pa.

STRUCTURAL STEEL PENDING

1800 tons, bridges in relocation project, Look-



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out Point dam, Oregon; bids to U. S. Engineer, Portland, Jan. 24.

550 tons, state bridge, Carbon county, Pennsylvania; Pine Brook Iron Works, Scranton, Pa., low on general contract.

250 tons, Newberry Co.'s store building, Spokane, Wash.; bids in.

150 tons, microwave towers, for Bonneville Power Administration; general awards to three local companies.

100 tons, two railroad bridges East low canal, Columbia Basin project; American Bridge Co., Pittsburgh, apparently low, $25,343 f.o.b. Gary, Ind.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, bridges and highways, route 128, Needham-Wellesley-Newton-Weston, Mass., to Amerbridge, to Bethlehem Steel Co.; V. Barletta Co., Boston, general contractor.

475 tons, addition to University of Washington stadium, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Strand & Sons, Seattle, general contractors.

400 tons, water transmission line, Blue Hills reservoir section, Metropolitan District commission, Quincy, Mass., to Truscon Steel Co., Boston; Gil Wyner Co., Malden, Mass., general contractor.

200 tons, sewage plant and facilities, Waterbury, Conn., to Concrete Steel Co., New York; F. H. McGraw Co., Hartford, Conn., general contractor. New England Iron Works has been awarded 80 tons of structural steel for this project.

150 tons, city hospital addition, Brockton, Mass., to Bethlehem Steel Co.; George B. H. Macomber Co., Boston, general contractor; 50 tons, structural steel awarded to A. O. Wilson Structural Co., Cambridge, Mass.

REINFORCING BARS PENDING

757 tons, New Jersey turnpike work in Newark and Harrison; bids Jan. 31; also 138 tons of caissons.

195 tons, New Jersey turnpike work, Hudson county; bids Jan. 31; also 52,600 lineal feet of steel piles.

Unstated, 14-story, $3 million Ione Plaza apartments, Portland, Oreg.; general contract to Republic Construction Co., Los Angeles.

Unstated, 10-story, $1,280,000 apartment building, Portland, Oreg.; general contract to Reimers & Jolivette, Portland.

PLATES . . .

PLATES PLACED

250 tons, addition to University of Washington stadium, (piling) to Bethlehem Pacific Coast Steel Corp., Seattle; Manson Construction Co., Seattle, general contractor.

PIPE . . .

CAST IRON PIPE PENDING

250 tons, system extension Tacoma; 12 and 8 inch pipe; Kendall Construction Co., Tacoma, low $68,157 for general contract.

175 tons, 20 inch cast ion pipe, Blackstone Valley sewage project, Providence, R. I.; contractors letting.

105 tons, 8 inch cast iron pipe, Springfield, Mass.; bids in.

100 tons, 10 inch and smaller; bids to Board of Regents, University of Washington, Seattle, Feb. 7.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Louisville & Nashville, 52 diesel-electric locomotives, thirty-seven 1500-horsepower road freight units and six 1100-horsepower switch engines going to Electro Motive Division, General Motors Corp., La Grange, Ill., and nine 660-horsepower switch engines to the American Locomotive Co., New York.

Missouri Pacific, 77 diesel-electric units, 47 going to the Electro-Motive Division, General Motors Corp., La Grange, Ill., 19 to the American Locomotive Co., New York, and 11 to Baldwin Locomotive Works, Eddystone, Pa.

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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

EMERYVILLE, CALIF.—General Electric Co. has purchased a tract here as site of a new warehouse for General Electric Supply Corp.

RIVERSIDE, CALIF.—University of California will begin construction of a $5,889,000 branch campus, project to include five structures.

SAN FRANCISCO—U. S. Rubber has awarded contracts to Bechtel Corp. for construction of a $400,000 brick and steel office and warehouse building.

SAN FRANCISCO—Utah Construction Co. has been awarded a $3 million contract for relocation of 11.4 miles of Union Pacific Railroad trackage and construction of 10 miles of state highways in Washington state. The work is preliminary to closure of the Columbia river at McNary dam next October.

SAN JOSE, CALIF.—Barron-Gray Packing Co., a division of Hawaiian Pineapple Co., will build a $250,000 steel and concrete warehouse to replace a similar structure destroyed by fire.

DELAWARE

DOVER, DEL.—Baseline Mfg. Corp., pipes, has been chartered by the corporation department of the Secretary of State's office. American Guaranty & Trust Co., Wilmington, Del., is resident agent.

DOVER, DEL.—New England Steel Corp. and New England Steel Development Corp. has been chartered by the corporation department of the Secretary of State's office here. Corporation Trust Co., 100 W. 10th St., Wilmington, Del., is serving as the principal office.

DOVER, DEL.—Schacht Steel Ltd., steel, has been charted by the corporation department. Secretary of State's office here. United States Corp. Co. is serving as principal office.

WILMINGTON, DEL.—Delaware Power & Light Co. announces authorization of expenditures aggregating $25 million during 1950 for construction purposes. More than $12.6 million will be spent on the Edge Moor power station started last spring and scheduled for completion in 1951 at total cost of $25 million. Another $3,660,000 will be spent on the new steam generating unit being added to the Vienna, Md., generating station; $2.6 million will be used to construct new transmission lines. A total of $4.9 million will be spent to improve and extend service to present and new gas and electric customers.

IDAHO

BOISE, IDAHO—Vernon Bros. and C. L. Electric Co. are apparently low bidders, $179,644, to Bureau of Reclamation for installation of equipment at Anderson Ranch dam.

LEWISTON, IDAHO — Potlatch Forests Inc. announces general contract for construction of pulp and paper plant awarded to W. J. Park & Sons, Yakima, Wash. Completion is scheduled for Jan. 1, 1951. The company will use hog fuel from its sawmill plants.

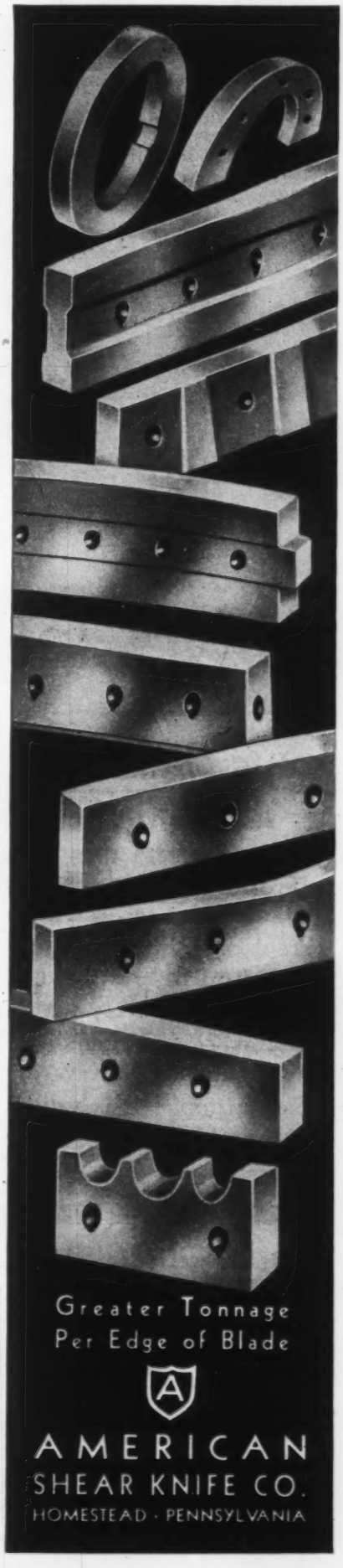
MICHIGAN

DETROIT—Michigan Tool Co. is erecting an addition to its newly acquired manufacturing building in Traverse City, Mich.

DETROIT—Mohawk Zinc Corp., 7925 W. Lafayette Blvd., has been formed by Harry B. Aronow, 18425 Muirland Ave., to refine and sell zinc products.

DETROIT—Concrete Steel Corp., 1322 Michigan Bldg., will manufacture and sell building materials; William H. Cook, 840 Washington, Grosse Point, incorporator.

DETROIT—Barton Steel Products Corp., 7170 E. McNichols, has been formed by Marion Kratze, 8315 Lincoln Rd., Huntington



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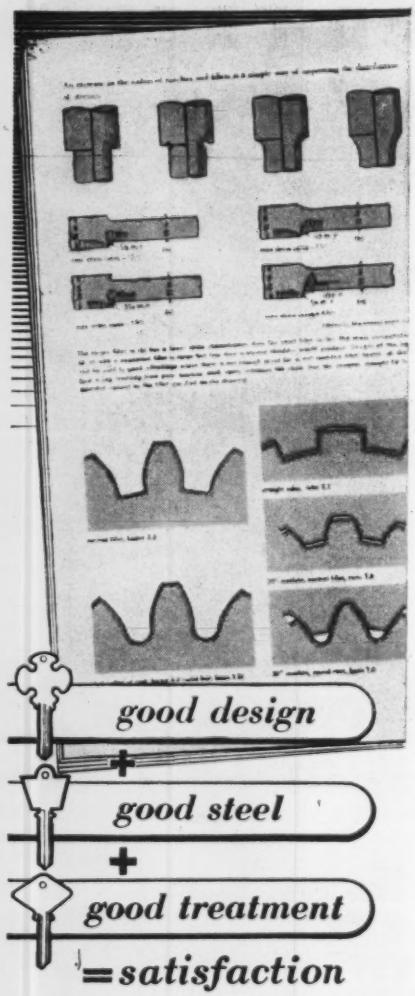

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DETROIT — Peabody Industries Inc., 915 Dime Bldg., has been formed to manufacture metal testing instruments; Edward E. French, 16825 Cranford Lane, Grosse Point, incorporator.

DETROIT—Frankland Corp., 312 McKerchey Bldg., has been formed by James M. McKinnon, 130 Gladstone Ave., to manufacture and sell heating devices and appliances.

NILES, MICH.—Davis Products Co., 919 S. 11th Ave., has been formed by Howard C. Davis, 1652 Broadway, to manufacture and sell component parts of house trailers.

OHIO

CINCINNATI—A new warehouse and office building to cost approximately $1 million will be built on Spring Grove avenue by Joseph T. Ryerson & Son. Plans call for three wings, each with cranes, and a unit two stories high for offices.

CLEVELAND—Weatherhead Co. is spending $250,000 to install equipment to make liquefied petroleum gas products. It will bring to Cleveland more than $1 million worth of production formerly done by subcontractors outside of the area.

CLEVELAND—Central Castings Co. Inc. has been chartered through attorney Carl W. Schaefer, 830 Leader Bldg., who said the new firm will represent an established manufacturing concern in sale of castings made of gray iron, aluminum, etc. Incorporators besides Mr. Schaefer are Richard C. Schaefer and Harold C. Schlenker

CLEVELAND—J. W. and Jack Harwood have incorporated the J. W. Harwood Co., 1874 E. 59th St., which they formerly operated as a partnership. The company is primarily engaged in manufacture of forging dies, and is planning to expand into other fields of the die and mold business.

LEETONIA, O.—Lee Welding & Mfg. Co. has been incorporated by Homer G. Gettman, Central Tower, G. E. Gettman and Herman Brandmiller, Jr., all of Youngstown, to manufacture and deal in steel, aluminum and other metals.

TENNESSEE

KNOXVILLE, TENN. — Southern Railway System announces a 2-year, $3 million project to rebuild and modernize its John Sevier Yard.

TEXAS

HOUSTON—Fish Engineering Corp., M. & M. Bldg., has been awarded a $1.5 million contract for prefabricating a butane-asphalt refinery.

FERROALLOYS

(*Continued from Page 91*)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. And 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

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